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DO PLANTS ABSORB NITROGEN?

ALTHOUGH the question opened by "Student's" query in your last issue (page 231) would demand a special article dealing completely with the absorption of nitrogen by plants, a short note may be of some service.

Briefly stated, plants have access to nitrogen in two conditions—*i.e.* (1) As free uncombined nitrogen in the air; (2) In a combined state (as salts of ammonium, nitrates and organic compounds in the soil). A very large number of carefully conducted experiments have shown that the absorption and assimilation of nitrogen in a free state is confined to the lower orders of plants—mainly bacteria—and to leguminous plants among higher green vegetation. Wheat, Rye, Buckwheat, cruciferous plants, and many others not belonging to the Leguminosæ, always die of nitrogen starvation when grown in soil containing very little or no nitrogen, although they may be exposed to the air. Moreover, leguminous plants die under these conditions unless their roots are possessed of fleshy "nodules" (well seen on the roots of ordinary Broad Beans). It is from the combined forms that an ordinary green plant—Wheat, for example—obtains all the nitrogen it possesses, and this it takes up means of its roots-hairs from the ground.

In the soil the plant has access to nitrogen in (1) complex organic compounds, resulting from partial decay of vegetable or animal remains; (2) ammonium compounds (*e.g.*, ammonium carbonate, sulphate; and also (3) nitrates, chiefly of sodium, potassium, magnesium, and calcium. It was formerly supposed that the ammonium compounds supplied plants with all the nitrogen necessary for growth, but definite experiments have shown that, although many green plants can be nourished by both organic compounds and pure ammonium salts, the results are in every way inferior to those experiments where the plants are supplied with nitrates to their roots. These facts, coupled with the knowledge that both organic compounds and ammonium compounds soon give rise to nitrates in the soil, lead to the conclusion that plants absorb or take up their nitrogen from nitrates, and seeing that nitrate of lime is most abundant in the soil it is concluded that this substance is the main source of nitrogen for plants.

"Student's" difficulty lies in the assumption, or statement, that nitrate of lime is taken into the plant as such—that is without any change. If this were true we should, as he remarks, expect to find the lime (neglecting the other bases, potash, soda, and magnesia), and nitrogen in something like the same chemically equivalent proportions as met with in nitrate of lime. This is found not to be the case. There is an excess of nitrogen and a deficiency of lime, as seen in the analysis quoted, and this has led "Student's" query and suggestion that the nitrogen must have been obtained from other sources than nitrates. The latter view has been amply refuted by most careful experiments, and the explanation of the apparent discrepancy is that the nitrate of lime is split up and decomposed at the very threshold of entry into the plant—*i.e.*, in the root-hairs and in the roots which are not included in the analyses given, which soon dry up and remain in the soil. The lime is thus separated and practically left in the soil, while the nitrogen enters into new combination, and helps to build up various more or less complex organic compounds. The ratio of the lime and other bases to the nitrogen in different plants grown even upon the same soil, and thus having equal access to nitrates, varies much.

The details of the chemical changes which nitrogen undergoes after entering the plant and where these changes take place are practically unknown yet. The changes are slow, compared, for example, with those undergone by carbonic dioxide, and difficult to follow. Different kinds of plants, growing with equal access to nitrates in the soil, show very different results as regards their method of taking up and utilising these compounds. In some cases the nitrates can be readily detected as such in all parts of the plant; in others only in the stem, or perhaps only in the root, or in no part at all.—JOHN PERCIVAL.—*Journal of Horticulture.*

COFFEE PRODUCTION IN THE MONTANA OF PERU.

Peru has been known for many years as a coffee-producing country, but the coffee grown on the coast has been absorbed by domestic consumption, and Peru's appearance as an exporter of this article is of recent date, although she is now likely to be a considerable competitor with other countries. Coffee planting began, and coffee is still cultivated near the port of Pacasmayo, with success. But although the cultivation on the coast could be somewhat extended, it must always remain restricted, as there are only certain favoured localities in which the planter can hope for a good return. The acting British Consul at Callao says that the region which Peru offers to the coffee planter unsurpassed in fertility, and almost unlimited in extent, is situated on the eastern slope of the Andes, at a height of from 6,000 to 2,000 feet above sea level, among the network of streams and rivulets that find their way into the great affluents of the Amazon. This region, known as the Montaña, has hitherto been shut off from the world by lack of communications, and, above all, by the difficulty of crossing the high ridge of the Cordillera that bars it from the coast. In spite of these difficulties, coffee has been cultivated both in the south, in the gold-bearing districts of Sandia and Carabaya, and in the centre of Peru in the valleys of Chauchamayo, Vitoc, and Huanuco. It is the Chauchamayo district—for most of the coffee that passes under the name of Vitoc or Huanuco comes from Chauchamayo—which is the real coffee-planting district of Peru, and it is the production of this region that has elevated Peru to the rank of a coffee-exporting country. This is due to the completion of the Central or Oroya Railway, by the Peruvian Corporation, to its present terminus at Oroya, giving railway carriage over the crest of the Cordillera, and also to the opening up of the Perené and adjacent valleys which form its prolongation. Oroya is about 60 miles from Chauchamayo valley, and there is a fair road all the way, passing though the town of Tarma, the capital of a department with about 7,000 inhabitants. The Chauchamayo Valley, itself about 10 miles long, is now in the hands of private owners, but the rich and far more extensive valleys beyond it of the Perené, Paucartambo, and Rio Colorado, have now been linked on to La Merced the last town in Chauchamayo by the extension of the Tarma-Chauchamayo road through a short but difficult defile. The output of coffee for the whole region was about 1,500 tons in 1893, but extensive planting has lately taken place and production will shortly, it is said, be trebled. It is considered that coffee can be grown at the expense of 5 Peruvian soles (sole=2s.) per quintal, or 100 lb., the yield of a tree after the third year being about 3 lb. The average cost of clearing may be taken at 65 soles (£6 10s.) a hectare, or £2 12s. an acre. The number of plants that can be planted with advantage on a hectare (2.47 acres) is about 1,700 to 1,800, or, say, 700 to the acre, although a larger number is often put into the ground. Young plants can be obtained for 10s. per 1,000.—*Journal of the Society of Arts.*

TAPPING RUBBER TREES.

Mr. D. P. Copeland, Deputy Conservator of Forests, Assam, gives the following report on the methods of tapping rubber trees adopted in Assam, and of collecting and preparing the rubber for the market:—

The mode of extracting rubber as practised by Mr. Martin of Tezpur.—Small funnel-shaped cane or bamboo baskets were prepared and coated with caoutchouc, after which the baskets were attached to the tree under the incision. The incision or cut was made diagonally and elliptical in shape, being about 3 inches across the centre and from 6 inches to a foot in length. Sometimes the cuts were made like an arrow head, thus V, the baskets being nailed with a bamboo nail just below the point. These baskets, when full, were emptied into cane receptacles coated with caoutchouc, and thus conveyed to the factory where the milk was poured into large wooden boxes or bins 6 feet square, and partly filled with water, the caoutchouc, after a time floating on the top. The caoutchouc (being still fluid) was then taken out and boiled over a slow fire on iron pans, which are still lying in Tezpur, 4 to 6 feet in diameter and 2 to 2½ feet deep, two parts of water being added to the caoutchouc, and the whole stirred constantly. As soon as the rubber coagulated into a mass, it was taken out with iron forks and pressed, and again boiled and pressed, and then dried in the sun, and finally washed over with lime. The rubber thus prepared was shipped direct to the London market.

The Assamese and Nepalese mode of extracting rubber is as follows:—The men begin from the top of the tree working downwards, making incision with their *daos* or *khukris* from 6 inches to a foot long and about 4 inches wide along the stem of the tree. The milk collects in these cuts, and also runs down the stems, some of the overflow falling to the ground. After four or five days, the rubber thus cut is dry, and can be pulled up very easily; it is then either wound round into balls or left loose. The ball rubber fetches a smaller price than the loose rubber, as very often a stone or other impurity is hidden inside the ball to add to the weight. The tappers try and get rid of their rubber as soon after collecting as possible, as it loses in weight by drying. The traders get over this difficulty by keeping it in water in barrels and wetting it well before shipping. The rubber undergoes no preparation in Assam, and is shipped to the Calcutta market in the same state as it is received from the forests, except, of course, the wetting with water already mentioned. I am informed that a machine has been put up at Margherita in the Lakhimpur division for cleaning rubber before shipping; but as I have only heard of the process, I cannot describe it. The most favourable time for tapping is from November till April, the dry-weather months. During the rainy season from May till October, the richness of the juice diminishes. From that time till January the rain diminishes, and the milk increases in richness.

While on the subject, I beg to describe a third mode of tapping rubber which has been the cause of the total destruction of our indigenous rubber forests in Assam; this system crept in gradually, and not having been suppressed with a strong hand, has left us ruined and killed out the rubber trees. I mean root-tapping. The Assamese, being too lazy to climb, were probably the first to find out that by tapping or cutting the root, of the tree along the ground much more rubber could be got and with far less trouble. I maintain, and can prove it, that stem-tapping, however severe it may be, unless it amounts to down-right girdling the stem, cannot kill out or parmanently ruin the tree; but root-tapping, as practised in Assam, kills out the tree at once. The roots of the tree are followed up for 40 or 50 feet along the ground, and every yard or so a hole is dug, and the root is cut clean through with an axe, a few large leaves being placed over the hole to prevent rain or due wetting the rubber; a week later the rubber is removed from the hole, being found in slabs from half a pound to six pounds in weight. Stem-tapping cannot be done during the wet weather, as the rain would wash off the caoutchouc from the cuts; but root-tapping with a little care, provided the trees are growing above flood-level, can be done the whole year round.—*Madras Mail.*

DIMINISHING MARGINS IN AGRICULTURE.

Where nature is prodigal, man is wasteful. Waste has been the rule in American agriculture. Accumulated mold of ages of vegetation was offered at $1.25 per acre. Afterwards it was given away, subject to official fees for perfecting a title, both to natives and immigrants. With land free to all there was prodigality of fertility and economy of labor.

Thus in primitive agriculture, rotation, cultivation diversification were all sacrificed, and fertility w.

transmitted into net cash. Because wheat could be grown without cultivation on the broken sod, and because it was always a cash crop, little else was grown; and because there was so much of it, and so few farm animals, the straw, which is worth as much in England as the whole crop is here, was burned to get rid of it; and because of this repeating of a crop without cultivation, weeds much more than loss of fertility reduced the rate of yield; until at last, because of extension of wheat area beyond the needs of consumption, price was reduced and profits destroyed. Thus nature, which can not be trifled with safely, has been avenged, and the wheat grower is muddled in trying to lay the blame upon the currency the tariff, or anything rather than his own uneconomical and wasteful practice.

The same abandon attended early efforts in animal industry. Unimproved breeds were kept four years or more, on lush grass in summer, in the lea of a haystack in winter, fattening at one season and existing at another, favouring the production of fat and lean, in layers, to be sold at low prices to unsatisfied consumers. The first butter dairies—for instance, Pratt's in New York—required forty pounds of milk to make one pound of butter. He, by selection and care, reduced the requirement almost one half, and now some Jerseys produce a pound of butter for thirteen pounds of milk. The "hogging down" of corn in feeding cattle and hogs was another wasteful procedure in primitive farming.

It was the same with cotton. The seed was wasted, or only used for manure. Sometimes stock was killed by being gorged over a pile of seed, but systematic feeding was unknown. Now forty million of dollars, more or less, represent the oil of the seed, which was wasted if applied to the soil, and almost as much more should be got from feeding the cake, with incidental foods to constitute a suitable ration, and costing almost nothing. In this way all the valuable elements of the seed are returned to the soil, with additional manurial value of other feeding material. Pork, if not beef, can be produced in the mild climate of the south with cotton seed cake, cow peas, and other fall and winter growing forage plants, even cheaper than the central west.

In wooded sections the first and largest opportunity for waste was found in the wanton destruction of wood and timber, and it was improved until large areas have become deserts. In every rural industry, exploration has been depletion and destruction. When flax became an auxiliary or successor to wheat, a million of acres went into cultivation for seed, and the straw was thrown away, though coarse fibre worth a hundred dollars per ton has been made of the straw as it lies from the mower; while, by a slight change of method of culture and treatment, as is done in Europe, far more valuable fibre can be produced. Flax-growers will say it cannot be done because they do not know how and will not learn, but it has been done and is done successfully and uniformlyin other flax-growing countries.

Reduction in prices and competition in production are lowering the margin of profit more or less, though not equally or by regular gradation year by year. The most careless are pinched fearfully, the more systematic only feel the tightening pressure of reduction, while the most skillful and scientific still find a reasonable profit in agriculture. It is well that these wastes in their primitive recklessness are no longer possible. The richest soil in the world never made an increasing yield, or retained a permanent fertility until higher values of land and greater cost of production compelled economy and improved methods. England once made smaller yields than the United States upon soils naturally less fertile. Now its average grain yield is more than double that of this country.

Thus there are compensations in reduced profit in agriculture. It is a spur to improvement, to the education of the farmer, more potent than any he has yet felt, and it is all the more valuable because its rewards go to the energetic and mentally alert, while the laggards fall behind in the race, and the slothful vegetate.—(J. R. Dodge, in *Prairie Farmer*)

THE COFFEE, CACAO, KOLA, &C. INDUSTRY IN JAMAICA.

A PRACTICAL PROPOSAL.

The Secretary read the report of the Committee appointed by the Board on Coffee, Kola, Chocolate and Pimento, which was as follows:—"The Committee reports that it has met and considered the matter referred to it and now submits the following *ad interim* report:—

Our remarks on coffee do not apply to the district of Port Royal Mountains, where the cultivation and curing of coffee is well understood and also the advantage of selling coffee in the cherry.

1. The general mode of "planting" coffee by the peasantry is as follows:—The land is cleared and burnt off; plants or "suckers" of from three to four feet high (which have been roughly uprooted) often having berries on them sometimes with diseased roots, are procured and frequently left to quail for a day or two before being replanted. As soon as the rains set in these suckers are planted among "ground provisions" without regard to regularity or distance from each other. After the "provisions" have been reaped the young coffee is often neglected and consequently when the trees arrive at maturity the yield is poor. In most cases too many large fruit trees are allowed to grow and overshadow the plants, thus depriving them of sufficient light and air;—again there is little or no attention paid to the invaluable practice of pruning, forking, &c., which is not yet understood by the peasantry.

Some years ago when the market price of coffee fell very low; in a great many instances the peasantry actually abandoned their cultivations.

2. The reasons generally given why so much apparently available land in close proximity to the dwellings of the peasantry is allowed to remain uncultivated, are, first, because the land has become impoverished by previous crops and is being left to nature to be resuscitated. Second, because they prefer to hold their own land in reserve against the time when they may not be able to rent land, and often the soil is unsuitable for coffee, such as clay.

3. The yield of coffee may be increased by better cultivation, proper pruning, and the use of manures. Cultivation and pruning are well understood by experts, but our people need to be instructed with regard to them, this we think may gradually be done by leaflets, lectures and demonstrations.

4. To practically demonstrate to our people the value of improved methods of cultivation such as planting, draining, forking, manuring, pruning, &c., it is advisable that the President's suggestion be carried out and "model grounds" be established in certain districts at the expense of the society, and we recommend that Mr. H. Cork's offer in Upper Clarendon for experimental purposes be accepted and that the Secretary in the first place be requested to visit the spot and arrange matters.

5. The inferior quality of coffee produced by the small settlers is due chiefly to the manner in which the article is prepared for the market. The primitive style (in most cases) of curing the coffee on the bare earth and in wet seasons actually resorting to the use of iron pots as a dryer, must affect the quality. Added to this the evil resulting from the reckless manner in which this article is purchased by the runner or buyer, without regard to quality certainly does not tend to improve matters. In our opinion therefore the best remedy on the state of affairs is the establishment of Central Factories for the purchase of coffee in the cherry and the proper curing by a good set of works. The advantages to be gained by these central factories should be brought to the notice of our people by leaflets and lectures.

6. We have carefully considered the subject brought to the notice of the Board of Management by the Colonial Secretary from a letter from the Collector of Taxes, for Manchester, calling attention to the poverty of the peasantry owing to the impoverishment of land in that parish, and as far as

our investigations have gone we are of opinion that assuring the existence of the state of things represented the cause and possibly a remedy may be found in the foregoing remarks.

7. We recommend the distribution of the leaflet on Cocoa published in July by the Director of Public Gardens, a large number of which have been placed at the disposal of the Secretary.

A leaflet on Kola is also being prepared which can be dealt with in the same manner.

8. The Curator of the Museum having taken up the matter of Pimento, the committee will not deal with it.

Mr. Burke moved the adoption of the report and said that it showed that the committee were doing their work well. They could not do too much for the cultivation of coffee, as recently he saw that the exportations of the article had greatly decreased, and the Society should press upon the peasants the necessity for new and improved methods

The Chairman said he was planting about 60 acres of Liberian coffee in St. Catherine, and he would be glad to give the Secretary samples in order to supply the peasantry with them.

A resolution was passed approving of and giving effect to the recommendations of the Committee.

Mr. Burke called attention to the enormous waste of everything that could be used for manure in the Island. If some material were obtained and thrown in and the compost allowed to rot, a first rate manure would be got. The peasantry should be told that what they would thus put into manure would be returned to them from the land.—*Jamaica Agricultural Society.*

WATERING.

There is probably no one operation in the whole routine of gardening that is more thoughtlessly carried on than that of watering. The individual requirements of particular plants are little thought of, and "watering" is administered indiscriminately to each and all alike. Where there is a mixed collection to be dealt with, the difficulties in adjusting the supply to the needs of the individual are, no doubt, great, but in market establishments, where large quantities of one plant are grown, and where a house or houses are set apart for the exclusive cultivation of some particular subjects, the difficulties are materially lessened, though not overcome. In any case it is most important to gain a knowledge of the principles which govern the relations between the growing plant, the amount of water it receives, and the period at which it receives the supply.

That a plant needs water, suffers if it gets too little or too much, that it requires more at one time than at another, and that different plants vary in their requirements according to their conformation and structure, and the circumstances under which they are growing—all this, of course, is well known, though in practice it is often not remembered or acted on.

Again, the influence of excess or deficiency of water may affect not only the individual plant, but may determine variations in the productiveness of the plant, and induce variations in the number, size and vigour of the seed and its contained embryo. In reference to these matters, the *Revue Scientifique* for July 6 publishes a report of a thesis prepared by M. Edmond Gain, and presented to the Paris Faculty of Science. The general character of this thesis may be gleaned from what has already been said, but it may be of interest to add a brief summary of the conclusions at which M. Gain, a well-known author on agricultural chemistry, has arrived, as they are of great practical importance. There is, says M. Gain, an alternation in the requirements of plants for water. Continuous deprivation or continuous supply of water are alike contrary to the physiological requirements of plants. In all M. Gain's experiments those plants which were supplied with water at the two critical periods—the commencement of the unfolding of the leaves, the beginning of the flowering period—and at no other time, did as well as those provided with a continuous supply of water during the whole period of vegetation. Further, the experiments of M. Gain showed that this influence of moisture is not felt equally by all the organs: it has a greater effect on the aërial than on the subterranean organs. The result of this differing influence is shown in the fact that plants grown in dry soil have thicker roots than plants in damp soil, though the stems may be equal in weight. This is in accordance with the well-known fact that plants of very dry countries have frequently roots which are very large in comparison with the weight and height of their aërial parts.

With regard to the influence exercised by the greater or lesser quantity of water on the propagation of the species, the researches of M. Gain have established the two following facts, relating, the former to seeds, the latter to the tubers:—

1st. The humidity of the soil favours and greatly augments the number of fruit and seeds, but drought induces the formation of larger and heavier seeds. On damp soil a plant yields smaller seeds, which consequently, tend to bring about the degeneration of the species.

2nd. The number of the tubers is but little influenced by the variation in the retentive powers of the soil for water, but on damp soil the plant yields larger tubers. There is then an increase in weight; the polarity of these tubers is, however, not much marked, and they are consequently less perfect than those which have been submitted, in the heart, to relative dryness.

It may be repeated that moisture perceptibly increases the immediate yield, but tends to the formation of imperfect reproductive organs, which produce less vigorous plants. This is to the advantage of the individual, but to the detriment of the conservation of the species. The practical inferences are obvious.—*Gardeners' Chronicle.*

IMPROVED PLANTING.

The Importance of Large Pits.—To begin with the very important work of pitting.—What is the object of providing pits for young plants? Why not simply dibble them in anyhow? Simply because the tender young rootlets must have a free loose soil to enter on all sides, or the growth of the plant will be checked and its vitality impaired. This being so, is the size of the pits usually dug sufficient for this purpose or not? Who has not remarked the check young plants receive at that period of their growth when the rootlets have reached the hard sides of the pits and are too weak to enter the hard soil beyond. By the nature of things this check occurs at a very critical moment of their existence and has a lot to say to the prevalence of "failures." The pits usually dug, on the Nilgiris at any rate, and I believe in the other districts also, are so-called 18" cube circular holes. As a matter of fact the real size seldom exceeds 15", which is far short of the actual requirements of the plants.

Pits 3 x 2 x 2 Just as Cheap as 2' Cube.—At first I made my pits 2' cube: now, as I find it entails no extra cost, I make them 3 x 2 x 2 deep. The seeming puzzle about the cost lies in the fact that in the latter pits the cooly is able to use a basket to remove the earth, while in the former he cannot. Perhaps the most uniformly successful of the older Nilgiri estates is Hillgrove, which was planted up many years ago by Mr. Riley in large 2ft and sometimes 3ft. pits, particular care being taken to remove all stones from the pits. Hillgrove is, I believe, the only estate in the district which has been planted up in this manner.

Stir up Your Soil.—As a class we planters seem to be now more appreciative of the value of what farmers at home call "tilth," and of the aëration of the soil. As it is difficult, though not impossible, to do very much without serious injury to the large roots on an old plantation, let us do all in our power at the start. What is the best model to copy from? I won't take my readers further

than the nursery from which the young plants were taken. Why not try and obtain as nearly as possible the same results on the estate, though of course by different methods.

EXCELLENCE OF LARGE RENOVATION PITS.—The nearest approach I can recommend is the digging over the whole area—when the estate is first planted—with large renovation pits, commencing with every other row. Fork them a full fork's depth at the bottom, leave them open for 2—3 months, and fill them up again with the same soil. When a block is finished, pit again over the alternate rows. Thus every four plants have a pit in their centre. Almost every square food of the land is thus dug up in time, say in the first three years from date of planting. This gives the young coffee roots from the very first a free access to the greater proportion of the soil. The ground is well aërated and its physical condition improved. The stones of food in the ground can be easily tapped, being rendered more soluble by the free access to the soil of air and rain, saving the cost of heavy manuring. Being porous, the soil absorbs every shower in the dry weather and drains off the excess in the monsoons readily through the subsoil. In droughts the coffee-roots can obtain the moisture required well below the surface, and in the wettest of weather are not troubled by any excess. It is clear that in all ways the estate with a cultivated depth of 3 feet (for this is what the above system comes to) has an immense advantage of those estates which have their soil only partially stirred up to the depth of 15 inches or less.

RESULTS OF CAREFUL CLEARING.—There is another point I have not yet touched on, and yet in the example before me, *i.e.*, the nursery, it is a most important one,—I mean the careful removal of all roots and stones which would prevent the free growth of the tender rootlets. On estates the presence of stumps and large stones has yet another evil: it renders cultivation appreciably more expensive and a great deal less efficient. Were the surface of an estate quite clean and friable, it would be possible to do a great deal more in the way of adding fertility to the soil than is now dreamed of. For one thing huge amounts of fodder for cattle might be grown after the plants have reached their fourth or fifth year and borne their first good crop, any excess being preserved in the shape of hay, or better still, ensilage. As this would all go back as manure, the result would be a gain and not a loss. If the cultivation were carefully managed, the plants would suffer very little, and were the crop a leguminous one, the roots left in the soil would greatly enrich it in nitrogen. Instead of taking it off the land, it might be cut and dug in, or buried in pits. The change in the nature of the soil in green-manuring the estate would be simply marvellous. The effect of the humus would be far-reaching and, unlike cattle-manure, would furnish plant-food for a number of years before becoming exhausted. Some will scout at all this. Let me ask these wherein then lies the value of virgin forest and jungle soil?

THE VANITY OF LARGE AREAS.—None of these things can be done of course without some extra expense. It costs more, no doubt, *at first*, to plant up an estate carefully and thoroughly than to stumble along in the old ruts of routine. In opening up large areas, the question of first cost assumes very large proportions, but I hold that the rage for large areas has done us planters more harm than any known plant-disease or low prices. As the general rule seems to be that the larger the area, the less money ought to be spent in proportion, I hold that it is practically impossible to cultivate a large estate as well as a small one. The greed for opening land and the desire to be counted among the "large proprietors" has done an infinity of mischief. The vanity extends so far that I verily believe there are men who would rather own a third share in a three-hundred acre estate than be the sole owner of a compact 100 acre block, giving perhaps 20% more income. It has been said that a man is deserving of honour who causes two blades of grass to spring where only one grew formerly. The burden of my remarks is that if a man is content with half the usual area, he can obtain quite double the usual yield. This, too, with a cost per acre but slightly higher than usual. There are numerous instances proving the truth of my contention to be found in every district, I believe, in South India. If this be so, what in the wide world can be called that twist of mind which compels men to open out in so many cases more than twice the land they can properly cultivate?

In agriculture all the world over the same thing is going on. In America they call it "*intensive*" *versus* "*extensive*" farming. Let us planters rank ourselves then among the intensive lot, and we may laugh at the mishaps which yearly befall the ill-regulated but arrogant extensives.—*Planting Opinion.*

A PRIMITIVE TOBACCO FACTORY.

China is nothing unless she is primitive, and although the factory which forms the subject of those remarks is not exactly situated in Chinese territory, as it is in the Portuguese settlement of Macao, it is, to all intents and purposes, a Chinese factory, for it is owned and worked by Chinese. The premises comprise several large sheds with earthen floors, and one or two better built rooms, used as storehouses. The factory gives employment to several hundred Chinese men and women. I was accompanied on my visit by Mr. A. A. Pettigrew, a son of Mr. Pettigrew, of Cardiff Castle, who is at present (May) on a tour in the East. The tobacco is not grown at Macao, but at a place called Hokshan, about forty or fifty miles to the north-west of the former town, on one of the numerous mouths of the Sikiang, or Canton River. When the plants are properly dry, they are done up into bales about 2½ feet long, 2 feet wide, and 1 foot deep, and sent down to Macao in junks. On arrival at Macao, these bales are stored in the premises of the factory until such time as they are required for the manufacture of tobacco.

The first room we entered was devoted to stripping the leaves from the stalks, these being discarded in the manufacture. Women, sitting on the floor on their haunches, were busily engaged in this operation when we entered. The sight of us did not distract the women's attention, but several young children who were present on our arrival, scampered away to distant corners like mice into a hole. The dust from the tobacco leaves got into our noses and throats, and caused us to sneeze and cough, much to the delight of our celestial onlookers, as evidenced by the loud outburst of laughter which followed our discomfiture. Strange to say, we did not hear a sneeze or a cough from any of the Chinese whilst we were in the factory. After the leaves have been stripped from the stalks, they are carried into one of the sheds in large bamboo baskets by men, then spread on a wooden floor and damped with water. When sufficiently damp, they are made up into layers about 2½ feet long, 2 feet wide, and 2½ inches thick, and placed on boards. The next process is to make each layer into a solid cake. This is done in the following way:—About a dozen layers, with a board 1½ inch thick between each layer, are placed on the top of one another, and then pressure is brought to bear upon the whole lot by means of a lever of the second order, in the shape of a thick pole. One end of the lever is fixed firmly with strong ropes, and this constitutes the fulcrum; the weight of the resisting substance is the tobacco, and the power is applied at the other end of the lever by means of stout ropes, which pass round a wooden axle that is securely fastened to the ground.

When the tobacco leaves have been properly pressed, the cakes are taken out and cut crosswise into strips 4 inches wide, and the two ends cut off, as they are not sufficiently pressed. The next step is to tie half-a-dozen of these strips together by means of ropes. The next operation is to make the tobacco ready for use. This is done by means

of a plane, very similar in shape to an English carpenter's plane. The strips of tobacco are stood up on end on the ground, and kept in position by boards made for the purpose. As the strips are only about 1½ foot high, the men have to work the plane in a half-stooping position, a most uncomfortable way of working from an Englishman's point of view. However, the Chinese do not appear to mind it, as they work away contentedly from morning to night. The shavings of the tobacco leaves are the tobacco ready for smoking. Every man puts his shavings, as he takes them from the plane, into small heaps, weighing about a pound each, enclosing at the same time a ticket with the name of the firm on it in the centre of each heap. These small heaps are then put into papers, the two ends of the papers being left open. The packets are then weighed, and a little more tobacco is added or taken away according to whether the packet is too light or too heavy. When the packets are of the proper weight they are put into another paper, both ends closed up, and then packed in boxes ready to be sent away. There is a good deal of order in the way in which the factory is worked. Women are only employed in stripping off the leaves from the stalks, men do all the rest of the work. There is one lot for damping and pressing the leaves, and another batch for cutting the pressed cakes into strips and tying them up ready for planing. The planers only make the tobacco and put it into heaps, a separate lot of men put it into the first papers ready for weighing. The men who weigh the tobacco pass it on to others, who put it into the second paper, and these finally hand it to the packers. The tobacco is of a dark brown colour, and is only used, so far as I know, by the Chinese. It has the reputation amongst them of being a particularly good brand, and the factory is said to be one of tho largest in South China. It was very amusing to see the workers at 12 o'clock, as this is the time they take their mid-day meal. As soon as the clock struck twelve, everything stopped as if by machinery. In less than five minutes tables were produced from unlooked-for corners, basins of rice and other foods were placed upon them, and the men were busily engaged in emptying them by the aid of chopsticks. All the workmen took this meal in the same place as they had previously been working in.—W. T. TUTCHER, Botanic Garden, Hong Kong.—*Gardeners' Chronicle.*

VANILLAS OF COMMERCE.

The following historical and descriptive account of the species yielding aromatic fruits, more or less used in commerce, has been prepared by Mr. R. A. Rolfe, A.L.S., Assistant in the Kew Herbarium.

From historical accounts we learn that vanilla was used by the Aztecs of Mexico as an ingredient in the manufacture of chocolate prior to the discovery of America by the Spaniards, who adopted its use, and Morren states that it was brought to Europe as a perfume about the year 1510 at the same time as indigo, cochineal, and cacao, and ten years before the arrival of tobacco.

The earliest botanical notice of the vanilla is by Clusius, in his *Exoticorum Libri Decem*, published in 6105. This author had received fruits from Morgan, apothecary to Queen Elizabeth in 1602, which he described as "Lobus oblongus aromaticus" (p. 72), without being aware of their native country or use. He describes them as 6 to 8 inches long by half an inch broad, and terete, from which it is evident that they belonged to the true Mexican *Vanilla (V. planifolia)*.

In 1651 a figure was given by Hernandez in his *Nova Plantarum Mexicanorum Historia* (p. 38), under the name of *Araco aromatico*, which shows both the characteristic growth and fruits of the plant, tho flowers not being represented. The original of this figure was one of a series of 1200 executed at great cost in Mexico, by order of the King of Spain, during the previous century. Hernandez only mentions its use as a drug and gives its native name as "Tlilxochitl."

Piso in his *Mantissa Aromatica*, published in 1658, appears to have first put the name Vaynilla on record, and also its use as an ingredient in the manufacture of chocolate (pp. 200, 201). He describes it as the fragrant siliqua or pod of the *Araco aromatico* of Hernandez, and that it was called Vaynilla by the Spaniards, who added it to chocolate, not only on account of its fragrance but because of its medicinal virtues. The name is the diminutive of tho Spanish *vaina*, a pod or capsule.

In 1675 Redi figured the pod and seeds, the latter as seen under the microscope (*Experimenta*, p. 179). He called it Vainiglias.

Dampier next furnished some important information about the plant. Speaking of the coast of the Bay of Campeachy, South Mexico, under date 1676, he remarks:—"Here are great plenty of Vinellos," (*Voyages*, II., pt. 2., p. 123). And at Boca-toro, in Costa Rica, which he visited in 1681, he observed:—"There grow on this coast Vinelloes in great quantity, with much Chocolate is perfumed" (I., p. 38). At a place called Caibooca in the former locality, Dampier remarks:—"We found a small Indian village, and in it a great quantity of Vinello's drying in the sun. The Vinello is a little Cod full of small black seeds; it is 4 or 5 inches long, about the bigness of the stem of a Tobacco leaf, and when dried much resembling it: so that our Privateers at first have often thrown them away when they took any, wondering why the Spaniards should lay up Tobacco stems. This Cod grows on a small Vine, which climbs about and supports itself by the neighbouring trees; it first bears a yellow Flower, from whence the Cod afterwards proceeds. It is first green, but when ripe it turns yellow; then the Indians (whose manufacture it is, and who sell it cheap to tho Spaniards) gather it, and lay it in the sun, which makes it soft; then it changes to a Chestnut colour. Then they frequently press it between their fingers, which makes it flat. If the Indians do anything to them beside, I know not, but I have seen the Spaniards sleek them with Oyl" (I., p. 234). He further remarks that the Vines grow plentifully at Bocca-toro, where he had gathered and tried to cure them but without success, and that he had never met with a Spaniard who could tell him, which led him to think that the Indians had some secret. "Could we have learnt the art of it, several of us would have gone to Bocca-toro yearly, at the dry season and cured them, and freighted our vessel. We there might have had Turtle enough for food and store of Vinello's........They are commonly sold for 3 pence a Cod among the Spaniards in the West Indies, and are sold by the Druggist, for they are much used among Chocolate to perfume it. Some will use them among Tobacco, for it gives it a delicate scent. I never heard of any Vinello's but here in this Country, about Caibooca and at Bocca-toro" (I., p. 235).

The preceding accounts all clearly refer to the true Mexican *Vanilla (V. planifolia)*, but in 1796 both Plukenet and Sloane introduce confusion into the records. The former includes the above under his "Vanillia's Piperis arbori Jamaicensis innasceus" (*Almagest. Bot.*, p. 381), though figuring the true plant (t. 320, fig. 4). The latter, while retaining Clusius' original name, and citing the above references, records it as growing spontaneously in the woods of Jamaica about Aqua-alta (*Cat. Pl. Ins. Jam.*, p. 70). In his *Natural History of Jamaica*, published in 1707, he further observes:—"It is said by several that they grow in this island about Aqua-alta, and that before the felling of timber and clearing ground, they were common in the shady bottoms of the inland parts of this island." (I., p. 180), so that it was evidently included on hearsay evidence, and probably the indigenous *V. inodora (V. anaromatica*, Griseb.) was mistaken for *V. planifolia*.

The Mexican Vanilla was, as already observed, introduced to England very early in the seventeenth century. The second volume of Miller's *Gardeners' Dictionary* appeared in 1739. There the author remarked that he had some branches of the plant, gathered by Mr. Robert Millar at Campeachy, and

sent between papers by way of sample, and as the stems appeared fresh, though gathered at least four months, he planted them in small pots and plunged them in a hotbed of tanner's bark, where they soon put out leaves and roots. It is probable that they were soon afterwards lost.

Shortly afterwards Catesby gave a good coloured figure of *V. inodora*, including flowers and fruit, but in his remarks completely confounded it with the true economic plant.

Thus three distinct species had become confused together, and these are all included by Linnæus, in his *Species Plantarum*, in 1753, under the name of *Epidendrum Vanilla* (p. 952).

Between 1830 and 1838 Bauer and Lindley's *Illustrations of Orchidaceous Plants* appeared, and we find plates 10 and 11 of the *Genera* devoted to the structure of flowers and fruit of *Vanilla planifolia*, Andr., "drawn by Mr. Bauer in 1807." This is the first evidence of the production of fruit in Europe, and as the drawing was made in the same year as Salisbury's figure appeared, it is practically certain that it was made from the very same plant. How the flower became fertilised is not mentioned, perhaps accidentally or by some insect. Morren suggests that the fruit was drawn from a specimen of commerce, but the colour, the uniformly plump texture, and the fact that it is attached to the rachis, all show the contrary; quite apart from the fact that the vanilla of commerce was then thought to be produced by another species, *V. aromatica*, which even Morren states that he sought for in vain in the gardens of London and its environs, and at Kew, and wrongly supposes it to be the plant cultivated by Miller in 1739. Morren is also wrong in stating that the "Vanilla planifolia (?)" of Lindley's Herbarium is "the very same plant drawn in flower by Mr. Francis Bauer," for it came from a Botanic Garden near Moscow, as the ticket "ex horto Gorenkensi" proves.

To Professor Charles Morren, of Liége, belongs the credit of first producing fruits in quantity, and of proving that *V. planifolia* was the source of the true vanilla of commerce. By a particular method of treatment adopted he succeeded in obtaining 54 flowers on one plant, and these he fertilised artificially, and obtained the same number of pods. The following year a crop of about 100 pods was obtained from another plant by the same method. His paper, "On the production of Vanilla in Europe," was read before the British Association at Newcastle, in 1838, and published in the following year (*Ann. Nat. Hist.*, ser. 1, III., pp. 1-9). He also succeeded in tracing his plant back to the one which originally flowered in the collection of the Right Hon C. Greville, and also its introduction to Java, as has been already pointed out. Thus Morren first proved the necessity of artificial fertilisation, and he attributed its not bearing fruit in the East Indies to the absence of the species of insect which doubtless existed in Mexico, and there fertilised the flowers. He also suggested that vanilla might be produced in intertropical colonies, and also in European hothouses, by artificial fertilisation. Detiel states that artificial fertilisation was first practised by Neumann, in 1830, in the Jardin des Plantes, but Morren makes no mention of it. In 1815 Blanco described a species of *Vanilla* from the Philippines, which he had received from his friend Azaola under the name of *V. majaijensis* (*Fl. Filip.*, ed. 2, p. 593), but it has since been referred to *V. planifolia*, and thus, if the determination is corect, it may have been at some time introduced from Mexico by the Spaniards. Blanco describes the pod as not aromatic, but it may not have been mature when he received it.—*Kew Bulletin.*

THE INSECT ENEMY, „ORTHEZIA INSIGNIS."

Dr. Trimen, in his annual report on the Botanical Gardens for 1893, mentioned the occurrence in the Peradeniya Gardens of an insect pest the *Orthezia Insignia*, which had proved rather destructive to the ornamental shrubs there. It afterwards spread to the lantana outside, but Dr. Trimen was of opinion that it was mainly a garden pest, and that it would not spread to estates. Mr. E. E. Green, of Pundaloya, contributed what appears to have been a rather sensational article on the subject to the "Tropical Agriculturist" for January last; and it is replied to in the "Kew Gardens Bulletin" for June and July, just to hand. Mr. Green stated that the pest "has, fortunately, as yet shown no taste for either of our two most important products tea and cocoa. Coffee, however, does not share this immunity, for trees of Liberian coffee have been observed to be infested with the insect, and we have no reason to suppose that the Arabian species will be less liable to attack." The insect was first described by Mr. J. W. Douglas—with whose name it is consequently associated—from specimens found in Kew Gardens, where, Mr. Green remarked, "it is now said to be doing an enormous amount of damage in the plant houses. . . . . Originating as it does in the Peradeniya Botanical Gardens, there is little doubt that we owe the introduction of this pest to plants received from Kew." The "Kew Gardens Bulletin" editor replies that "Mr. Green's statement as to 'the enormous amount of damage in the plant-houses' caused by the insect is very much exaggerated, and I am unable to ascertain the authority on which it is made." The Assistant Curator was also requested to report on the subject, and he states that their Hongkong *Strobilanthes* is not much affected, but species of this plant from India and Ceylon are much subject to *Orthezia*. No appreciable harm is done to the plants, even when badly infested, and it is the least harmful of all the insects parasitical on plants at Kew, where it is "rather a curiosity than a troublesome pest." Some interesting comments follow on the question of the introduction of the pest into Ceylon and we consequently give the two concluding paragraphs of the Assistant Curator's report *in extenso*:—

The dispersion of plant diseases through the interchange of plants is undoubtedly a peril requiring careful precautions. The *Phylloxera* was introduced from England into Switzerland. The Coffee-leaf disease (*Hemileia*) has been conveyed from Ceylon on the one hand to Fiji (with tea seeds), where it practically extinguished the promising coffee industry, and to German East Africa on the other. It has always been a matter of the deepest anxiety lest by any accident it should be introduced through Kew to the New World, where it does not at present exist. It has been no less a matter of anxiety lest the coffee-leaf miner should be introduced into the Old World. Kew extends, undoubtedly, and involuntary hospitality to many strange guests, which come unbidden no one knows whence. The remarkable land Planarian, described by the late Professor Moseley as *Bipalium Kewense*, which is generally to be found in the houses, is a case in point.

It is undoubtedly possible that the *Orthezia* may have reached Ceylon by way of Kew. It is not, however, very probable, and the reverse may just as well have been the case. It exists in the public exhibitions, however, from which plants are not drawn for exportation. The plants in the propagating houses from which distribution is made are kept scrupulously clean, and every precaution is taken to send them out free from taint of any sort or kind.—Local "Times."

A CHAT ABOUT JAPAN TEA.

Professor Dr. Max Fesca, went to the Far East country in 1882, for three years, as he thought. He has remained there ever since, but he now thinks it probable he will not return. The Professor has been engaged in geological and agricultural surveying in Japan, and he has, naturally, seen a good deal of tea cultivation. It was concerning this that our representative waited upon Dr. Max Fesca, at the Bristol, this morning, when he found him "ready to communicate."

TEA VS. THE MULBERRY.

"Tho Japanese manufacture green tea almost solely,' said the Professor in response to a question. "What is consumed in the country cannot be determined by accurate data; but thoy export from five to six million *yens* worth per annum, and this may be said to be all green tea, and almost all of it goes to America."

"Can you tell me why the amount exported is not increasing?"

"The mulberry," was the reply, "is already growing along with the tea, and silk culture and manufacture is far more profitable and attractive to the people. They export 16 million *yens* of silk, and this is a minimum estimate. Thus, I think, the export of the green tea will decrease instead of increasing; and that the extension of the mulberry will be preferred. The old famous tea districts will remain; but there will be little new land opened up in tea, and some will be changed in favour of silk production."

THE AGE AND YIELD OF TEA.

"Anything about tea interests us here, Professor; will you tell me what effect age has on the bushes?"

"There are shrubs 150 years old, and though the quantity is less the quality is better than when they were young. That is the rule in good districts where the soil is suitable. The average up to which the heavy yields continue is some 30 years, and then, as I have said, the quality rather improves. There are two seasons for plucking; in the year, the first commencing now, on a little later, with the summer monsoon. In a wet year there would bo a third time of plucking; but this would be only inferior tea. Of course, bushes have a rest in the winter; but it is a striking fact that the annual yield per acre in Japan is larger than in Ceylon or Java. I have compared the yields, and so beneficial is the winter rest, apparently, for the subsequent enormous reproduction of leaves, that the months of idleness compared with plucking all the year round, represents no loss at all, but the reverse. The Japanese cut the shrubs one metre high, and only in those districts which in winter have rather much snow are thoy cut lower. Every year the bushes are pruned into shape."

"CONCERNING MANURING?"

the interrogator remarked.

"Oil cakes, which are expressive out there," replied the Professor, "are used on the most valuable plantations; but in the ordinary way any kind of manure is used, according as it is available. The manuring commences from the beginning, and is not only done annually but several times a year, each bush being manured. On many places it is recognised as a mistake to use forcing manure. It is better, of course, to use a gentle, strengthening kind that will benefit the shrubs themselves, rather than produce an abnormal flush."

THE DECADENCE OF GREEN TEA, AND CEYLON PROSPECTS IN AMERICA.

"I can remember the time," continued our visitor, "when we in Germany drank a good deal of green tea, and it was so in England, too, where you can remember black and green were blended. Now in Japan itself the Europeans mostly drink the black tea from China, which is less strong. The Japanese, who take tea without sugar or milk, drink their own strong beverage, and take it in small cups in consequence. I don't think it is injurious; and I have found it very refreshing, after walking a long distance and going into a tea house by the road side. The price of tea has been going down and down, and this has been disappointing to the producer; besides which, from the value of the total export which I gave you in Mexican dollars, you will see that there must be plenty of room for Ceylon tea in the United States. Japan cannot by any means supply such increasing demands, though, of course" (in reply to a concluding question) "I am unable to say what Ceylon can do to induce Americans to drink its tea beyond the usual plan of making known what you have to offer, and showing that it is good value for the money. *Prosit.*"

"Thank you, and *bon voyage*, Professor."—Ibid.

VARIOUS PLANTING NOTES.

A New Pencil.—The Blaisdell Paper Pencil Company, Philadelphia, U.S.A., has introduced a kind of pencil, the lead of which is seen, on examination, to be covered with many very narrow trips of paper. The pencil never needs cutting in the ordinary sense of the word, but, to expose more lead, all that is necessary is to make a small slit in the paper near the lead, thus raising a tiny flap. By gently pulling and unwinding this, working towards the point, a spiral of paper is twisted off, and a length of the lead is laid bare. This process can be repeated as required, till tho pencil is too short to be used at all, and is less laborious, and is more certain in results than is cutting with a knife. The lead is excellent in quality, and keeps a good point. In appearance this pencil always resembles an ordinary cedar pencil, the "uncut" end of it being covered with red glazed paper, which increases the likeness, and is pleasant to handle.—*Gardeners' Chronicle.*

The Cotton Plant is losing its popularity as a "safe investment" in the very heart of the cotton-growing States of America. Time was—some forty years since—such an assertion would have been laughed at. "You cannot do without American cotton" was the article of faith set up by growers and brokers on tho other side of the Atlantic; starvation in Lancashire during the cotton famine shook the belief in many minds, and alterations in spinning and weaving machinery brought under subjection cottons of short staple; planters and capitalists took up tho cultivation of the plant; and to-day, Lancashire is no longer dominated by New Orleans or New York. But planters in the Southern States kept on; and in the face of a steady fall in prices, opened up all over the world a market for cotton seed, cotton oil, and cotton cake. Of course, the same products can be placed on the market wherever cotton is grown, and capital can be utilised. Should it be desired to learn where cotton is grown at the present time, the intelligence can be had from the "market" columns recording sales in any daily paper any morning in the week. And it has come to pass, that it has been determined to reduce considerably the growth of cotton in America. The result of the special investigation set on foot by the Federal Government's Agricultural Department in 720 Cotton-growing counties in tho United States shows that in eighty-eight there will be little or no change in acreage as compared with 1894; five report an increase up to 10 per cent.; two, an increase of from 11 to 20 per cent; three an increase of from 21 to 30 per cent.; and three an increase of over 30 per cent.; 127 show a decrease of 10 per cent. and less; 250 a decrease of from 11 to 20 per cent; 158 a decrease of from 21 to 30 per cent.; forty-four a decrease of from 31 to 40 per cent.; seven a decrease of from 41 to 50; and thirty-three a decrease of more than half. This decrease in acreage is not confined to any particular locality, but covers a widespread territory, embracing almost the entire area devoted to Cotton culture. The extraordinary low price of tho staple gave rise to the agitation as to the necessity for reducing the acreage in 1895; this resulted in a convention this year, and a rise in prices is hoped for. Doubtless, much may be done in improving the varieties now grown, and so placing on the market the highest class of raw material. Meanwhile, the above noted facts are surely well worth record.—Ibid.

THE PLANTING ENTERPRISE OF CEYLON: IN TEA, COFFEE, CACAO, CINCHONA, CARDAMOMS AND MINOR PRODUCTS: EXTENT OF CULTIVATION UNDER EACH PRODUCT IN SEPTEMBER, 1895. NUMBER OF PLANTATIONS AND SUPERINTENDENTS, &c.

TOTAL EXTENT CULTIVATED IN PLANTATIONS 379,182 ACRES.

In Tea 305,000 Acres.

No tropical industry—and probably no agricultural enterprise outside the tropics—has had so much care bestowed on the compilation of substantially accurate statistics concerning its position and progress as has the Planting Enterprise of Ceylon in the products above-named, and to a lesser extent in Coconuts, other Palms and Cinnamon. The first Compilation of the kind was made by a Committee of the Planters' Association led by Mr George Wall in 1856. Thirty-nine years ago it was a comparatively easy task to frame a list of the then limited number of plantations in existence, and to sum up a cultivation confined entirely to one product. This was done, as we have said, by the Planters' Association in 1856; but no further attempt was made to collate the acreage in cultivation, for thirteen years afterwards, until 1869, when the present Editor of the *T. A.* first prepared a complete review with this information. Since then at thirteen distinct periods—in 1871, 1873, 1874, 1875, 1877, 1881, 1883, at end of 1885, in the middle of 1888, of 1890, of 1891, of 1893 and now in the latter half of 1895,—the compilation has been carefully made and the position of the Planting Industry accurately gauged, our figures being adopted not only by planters and merchants, but by the Government and Civil Servants as the only available and reliable returns of an Industry which must be regarded as the backbone of the prosperity of the Colony. We have, in fact, at the expense of much time and labour for twenty-six years back, been doing the work which properly appertained to tho Agents of the Government, or to a special officer as Statist, and supplying information which in other Colonies and Dependencies, is only to be found in official publications. However, we have had our reward in the intimate acquaintance it has given us with all the phases of the more important industries of the country and in being enabled to follow closely each successive development of new branches of planting and agriculture generally. Especially interesting, although involving far more trouble, has been the work of collating the statistics since a variety of new products has been added to the old staple now so insignificant comparatively; and never perhaps has so much pains been taken as on the present occasion to secure accurate returns of the area planted with the all-important new king, Tea, and with minor Products, although no one can be more conscious than the compiler, of the impossibility of attaining perfect accuracy. Still for all practical purposes we believe, the results derived from our tables, may be taken as reliable statistics from which to gauge the present position of industries, the importance of which as regards the revenue, trade and general well-being of this community, cannot be over-estimated.

Taking first the total extent of the properties included in our Directory, namely 748,017 acres,—there is an increase of 23,212 acres on the return made up at the middle of 1893. This is owing chiefly to some 6,000 acres added to both the Kelani Valley and Matale East, partly through land sales and grants and partly transfers. Then there have been additions through more correct information or private purchases of about 1,000 acres to quite a number of districts, and in other districts additions are due to the revival of old properties for tea, that had fallen out of cultivation and notice. In other directions, more correct returns have slightly increased or reduced the totals for each district.

Turning to the more important figures representing the area now in cultivation with tea, coffee (Arabica and Liberica), cinchona, cacao, rubber, and the host of new and old products with which experiments are being made in different quarters, we find the grand total to be 379,182 acres, or an increase of 25,947 acres on the middle of 1893. This addition of 26,000 acres may not be considered much for the two years, more especially when it is remembered that over 4,000 acres additional have been brought into cultivation, in the Kelani Valley alone, 3,300 more in the Kalutara district and 1,700 acres in Matale East and Lagalla, in the interval; while Allagalla, Balangoda, Dikoya Lower, Dolosbage, Hewaheta Upper, Kadugannawa, Maskeliya, Matale West, and Udapussellawa, each show about 1,000 acres of cultivated increase. On the other hand, the higher districts, Dimbula and Dikoya, show scarcely any difference in their totals and Nuwara Eliya very little; but there is a distinct extension of cultivation both in Eastern and Western Uva if we take Haputale and Haputale West and the Badulla, Passara, Madulsima and Monaragala groups together. In respect of old coffee land, a revival has come in favour of tea. In Maskeliya, a comparatively young district, our cultivated return in 1883 was lower than in 1881 by 2,000 acres, indicating how coffee had then fallen out of esteem there; but all this has now been more than recovered under tea. On the other hand, it is noteworthy that neither in Dimbula nor Dikoya had any land gone out of cultivation—and the same is true of most of the Uva districts which, with the higher and younger divisions, never showed so large an area in cultivation as at present. That the total area under cultivation—after careful checking and verification of the returns—should stand so high as about 380,000 acres (or nearly 600 square miles), notwithstanding the adverse experiences of coffee and cinchona, is matter for surprise and gratulation, and shews how widely tea has been planted and how satisfactory, so far, have been the results.

PLANTERS AND PLANTATIONS.

Considering the efflux of planters from our shores during the period of coffee depression, no one will be astonished to learn that the total number of Superintendents fell from 1,389 in February 1881 and 1,108 at the end of 1883, to 1,079 by December 1885. Since then, however, the turn of the tide has set in steadily; for we had in July 1888 as many as 1,136; increased by June 1890 to 1,211; by August 1891, to 1,258; and in August 1895 to 1,334; while now we have the full number of 1,469 Superintendents and Assistants corresponding to 1,528 estates in cultivation out of a total of 1,962 properties. It is probable that more than 300 European planters left Ceylon in the four years, between 1881 and 1885; but a considerable number afterwards returned, while a very large quota of young men "to learn tea" have been added to the number of Assistant Superintendents. Perhaps we may fairly say that our planting community diminished at the rate of sixty Superintendents or Proprietor-superintendents a year, between 1880 and 1886—and that about 400 or about 45 per annum have since been added of old colonists returned or new men from home. The total now is higher than in the height of our coffee prosperity; although it is noteworthy that the number of separate plantations is not so large in proportion, a fact explained by the aggregation of small properties into one charge under the process which has given us so many Limited Companies among "tea estates."

The Analysis of the Cultivated Area is, however, of more practical importance than the foregoing total results. We must explain the principle on which the returns have been compiled. After giving the matter a fair trial, on a former occasion, we found it quite impossible to work out a suggestion made to us of securing returns from each estate of the number of trees (in thousands) of each product. In respect of all products, save cinchonas, we had to fall back on the old plan of acreage returns, asking for the figures representing each product whether cultivated in fields by itself or interspersed with others. We have thus obtained, as far as possible, the acreage in tea, coffee, cinchona, cacao, cardamoms, &c., planted alone; of tea or coffee intermixed, or planted with cinchona, or cacao or rubber; also of each of the minor products separately; and of tea and cinchona; cacao and rubber, &c. The total results under each head may be seen at a glance from the following:—

(*September, 1895.*)

	Acres.
Total extent of Tea *planted by itself* - -	296,753
Do of Coffee (*Arabica*) *cultivated by itself*	15,142
Do of Coffee (*Liberica*) - - -	264
Do of Cinchona do - - -	982
(besides 1,714,000 trees partly alone and intermixed),	
Do of Cacao by itself - - -	13,828
Do of Coffee and Cinchona *interspersed*	1,611
Do of Coffee and Tea *interspersed*	5,038
Do of Coffee and Cacao do - -	5,331
Do of Tea and Cinchona do - -	3,596
Do of Tea and Cacao do - -	448
Do of Tea and Liberian Coffee do - -	146
Do of Cacao and Liberian Coffee do - -	934
Do of Cardamoms alone - -	4,615
Do of Rubber do - - -	201
Do of Tobacco do - - -	45
Do of Cotton do - - -	109
Do of Other Products and some of the above mixed - - -	18,385

[Some Cacao and Liberian Coffee are mixed with Annatto, Coconuts and other products.]

To arrive at a fair estimate of the total extent which may be taken to represent each product, we have, in the case of cinchona growing among coffee or tea, taken from one-third to one-fourth the acreage for the cinchona, and credited two-thirds or more to the staple. In the case of coffee and tea, or coffee and cacao, being planted together, we have divided the acreage into two equal parts. Of course this would not be a fair criterion in every case: some planters who may have their 100 acres of tea or coffee interspersed with 20,000 cinchona

trees will maintain that the tea should still be reckoned at the full 100 acres *plus* the cinchona. But knowing as we now do by experience that the cinchona, where it matures, does not benefit the other product, but the reverse, it is misleading to count the full acreage of the staple, in addition to a certain extent of new products interspersed. However we have left the figures in the Directory lists and in our tables as returned to us from the estates and agents, to speak for themselves, and it is possible that some may consider that tea and coffee area should be counted in full, even when mixed with cinchona, cacao, or rubber. We have no doubt however, that the majority will agree with us that, analyzing the above figures in the way we have pointed out, and with a moderate estimate for the average number of cinchona trees per acre,

THE POSITION OF THE CEYLON PLANTING ENTERPRISE AT THE MIDDLE OF SEPTEMBER 1895 MAY BE REPRESENTED SOMEWHAT AS FOLLOWS :—

	Acres.
Total area of 1,962 plantations and planting properties - - - -	748,017
Do do of 1,528 plantations in cultivation with 1,469 Superintendents and Assistants - . . .	379,182
Total approximate extent under TEA . -	304,419
Do do COFFEE (*Arabica*) - -	21,634
Do do COFFEE (*Liberica*) - -	2,804
Do do CINCHONA [4,483,000 trees over 2 years.]	
Do do CACAO - - - -	18,278
Do do CARDAMOMS - - -	4,693
Do do RUBBER - - -	634
Do do TOBACCO (on plantation)	82
Do do COTTON do -	133
Do do GRASS (Cultivated) -	5,730
Do do of Annatto, Coca, Vanilla, Pepper, Cloves, Plantains, Citronella grass, Divi-Divi, Croton, Castor-oil, Aloes, Cinnamon, (on the coffee, tea, or cacao plantations) - - - - - -	7,397
Of Fuel, Timber and Fruit-trees, Span, Coconuts, Arecas, Nutmegs, Kapok (on the tea, coffee or cacao plantations) - - - - - -	16,000

We have 8,400 fewer acres under Coffee now than in the middle of 1893, and more than 2½ million trees fewer of cinchona. On the other hand we have an increase of nearly 31,500 acres in the staple (Tea) which is of chief interest. The cultivation of Cacao shows an increase of 2,000 acres which is very satisfactory as is also the extent added (366 acres) to Liberian Coffee, while the extent in Cardamoms and minor products has either been stationary or shows a decrease due to the great attention given to tea in the past two years, save in the case of timber and fuel trees of which several thousand acres have been planted in the two years. In giving 305,000 acres as the total area of tea, it must be remembered that certain proportions of clearings planted during the current south-west monsoon, are included. Nevertheless it is clear that 310,000 acres of tea will shortly be reached, and exceeded, were it only through the supercession of both coffee and cinchona where these are at present intermixed with the staple, in the proportions credited this time to the latter products. We may expect, indeed, to see the 5,038 acres at present credited to tea and coffee, altogether tea, and so with cinchona and tea, so that we are quite prepared to find our once great staple reduced from 272,000 acres (as ni 1877) to 20,000 acres by the time we make up another return, unless Mr. E. E. Green shows how green-bug and other enemies can be got rid of, and Liberian Coffee takes the start it deserves; while on the other hand tea will probably be represented by 315,000 acres in full cultivation by the middle of 1896.

In the returns of 1883, the considerable number of plantations with "abandoned" opposite their names, attracted attention: altogether they aggregated 53,540 acres; at the beginning of 1886 the aggregate was 40,000; but in the middle of 1888, the total of 298 "abandoned properties stood at 69,432 acres; in July 1891 there were entered about 293 "abandoned" properties aggregating 73,262 acres; while in 1893 through more careful returns, the total number was 324 with an area of 74,217 acres. We have now substituted the term "uncultivated" and the total of such estates is 289—or 35 less than in 1893—covering 65,727 acres; but a certain proportion of this extent—probably one-third—must still be considered reserve and untouched forest or chena land.

Of good forest reserves mentioned in many of our district returns, though not in all, the aggregate is about 57,000, but even if we add one-third of the uncultivated, making a total of 85,000 acres, we feel sure this is far below the actual extent of forest land in private hands. How, then, is the difference between the total area of 748,000 acres and the cultivated area of 379,000, namely 369,000 acres to be accounted for? Our estimate would be that of forest land fit for tea, cacao, Liberian coffee or other products, there are counting all reserves and un-opened blocks about 120,000 acres in private hands; that 50,000 acres represents the area of land once cultivated, but abandoned within the last 30 years and now growing up n weeds and lantana, and that the balance of about 200,000 acres may be put down as representing chena and patana (a good deal of both fit for cultivation,—especially in Uva, where patana land is turning out so well in tea—should prices of produce keep up) besides swamps and other utterly waste portions.

WEATHER FALLACIES.

The weather and aught connected therewith, it is almost a truism to say, is of universal interest. And yet Meteorology has not attained the dignity of an exact science; all science is the result of experience, and scientific laws are generalisations deduced from an observation of natural phenomena and of concrete facts. That being so, Meteorology ought to have outdistanced all other branches of scientific inquiry in respect of the sum of systematised knowledge. For have not the data been apparent to man ever since he set foot on this planet, ever-present to his senses, moulding his character and determining his prosperity and comfort, more so than all other external surroundings? And what is the result? In a prominent position in the columns of our newspapers we have printed "weather forecasts," issued officially, which, like dreams usually go by "contraries" not to speak of a host of persons who style themselves "weather prophets." That is all. Hesiod, it is on record, was among the first who presumed to dogmatize upon the weather. He and his successors have much to answer for. Sunday school pic-nics, garden-parties, and out-door gatherings are postponed in consequence of predictions which usually come to pass not on the day named by the "prophet" but on that on which such events actually take place. Then the "prophet" is reviled and the Sunday school teachers make remarks which it is not advisable their pupils should hear. But people follow his counsel next year, all the same and should the "prophet" prove correct, as he cannot fail to do if he goes on long enough, the fact is advertised, his fame blazoned forth and his reputation established for another period of years. After all the "prophet" is but the quack of the Meteorological profession. The regular professors have done and are doing a great work in systematising the results of world-wide observation. And it is not of them we would speak flippantly. Some day, perhaps we shall be able to forecast with certainty what the atmospheric conditions will be. Man has now got the heels of the weather. Approaching storms, thanks to an international system of Meteorological stations connected by telegraph, are duly heralded and timely warning given. But still that nebulous personage, the Clerk of the Weather goes on in the same inscrutable, and, apparently haphazard fashion scattering his favours here and his buffets there without regard to the convenience of mortals. While in the East he may delay the monsoon, thereby giving old-stagers, periodical opportunity for declaring that the existing state of matters is "unprecedented," it is in Britain, particularly in the northern portion, that his vagaries may be seen to most advantage. There he often adds insult to injury, for a man certainly does look foolish and feels in no enviable frame of mind when, attired in winter garments, the temperature rises to "summer heat." The situation is scarcely less trying when after one has donned a summer suit there are suspicions of snow in the atmosphere!

These contradictions notwithstanding, men have seized upon certain phenomena as weather signs and it is with exposing these fallacies that the President of the Meteorological Society in his latest address—chiefly deals. The President of the Royal Meteorological Society candidly admits that research shows "how little we have ourselves advanced in some matters since the time of Hesiod, Theophrastus and Aratus." In early times men, then as now, foretold what they desired, the wish being father to the prophecy and put down for a universal law that which was only a coincidence of totally independent events.

Mr. Inwards has no regard for St. Swithin, at least as far as the weather is concerned. According to him the saint has no more to do with the dryness or humidity of the season than has the sphinx. It is not always pleasant to be disillusionised even in the interests of truth and before Mr. Inwards' criticisms many will feel cherished ideas go by the board. There are, says he:—

"Forty weather saints, among the most prominent of whom is undoubtedly St. Swithin, whose day is July 15, and the superstition is that if it should rain on that day it will rain for forty days after. ...... This date is very near a well-known bad time in wet years, as the terms, long in use, of "St. Margaret's flood" and "Lammas flood" abundantly testify. The fact that some of these heavy rains began on July 15 has been enough material for the adage-monger, and so we have another "universal" law laid down, a law which is, however, constantly broken, as every student of the weather very well knows. The whole thing is a fallacy of the most vulgar kind, and ought speedily to be forgotten, together with all the adages which make the weather of any period depend on that of a distant day."

Regarding the attempts which have been made to connect atmospheric changes with the movements and position of the heavenly bodies Mr. Inwards shows that nothing has been proved to show that meteorological conditions depend in any way upon such factors. In this connection he quotes an interesting letter from Herschel dated Feb. 6th, 1814:—

"I am glad of an opportunity to say that prognostications of the weather are so much *above the knowledge* of astronomers that I have taken unknown pains publicly to contradict reports of predictions that have been ascribed to me. You may therefore be assured that what you have heard as my opinion about the frost is without the smallest foundation."

The moon, according to Lord Byron, is responsible for many things, but Mr. Inwards acquits her of any complicity in affecting the weather:—

"Even the halo round the moon has been discredited, for Mr. Lowe found that it was as often followed by fine weather as by rain, and Messrs. Marriott and Abercromby found that the lunar halo immediately preceded rain in 34 cases out of 61."

Coming down to earth the worker deals with the fallacies connected with the behaviour of plants and animals. He says:—

"Mr. E. J. Lowe, F.R.S., has endeavoured to put some of the rules from this source to the test of definite observation. He took a number of well-known signs said to indicate change and carefully noted what happened after each sign, and although he does not say that all indications from animals, birds and plants are useless, yet certainly those he did investigate seemed utterly to break down. He took the well-known signs of bats flying about in the evening, many toads appearing at sunset, many snails about, fish rising much in lake, bees busy, many locusts, cattle restless, landrails clamorous, flies and gnats troublesome, many insects, crows congregating and clamorous, spider-webs thickly woven on the grass, spiders hanging on their webs in the evening, and ducks and geese making more than usual noise. Mr. Lowe found that in 361 observations of the above signs, they were followed 213 times by fine, and only 148 times by wet weather; so that even after the prognostications for rain, there was a greater preponderance of fine weather. He called a day fine when no rain was measureable in the rain gauge. Mr. Lowe says that even swallows flying low cannot be depended on, as, especially at the close of summer and autumn, they almost invariably skim the surface of the ground, and Mr. Charles Waterton, the naturalist, decided, after careful observation, that the unusual clamour of rooks forms no trustworthy sign of rain. These must, therefore, swell the list of fallacies, although there are many other rules which have not been so carefully examined, but which may still be true. My own impression is that although it is painful to dismiss the animals from their ancient position as weather prophets, we may consider them as indicating what they feel, rather than as predicting what is to come, and that their actions before rain simply rise from the dampness, darkness or chilliness preceding wet weather, and which render these creatures uneasy, but not more so than they affect man himself.

As to cows scratching their ears, and goats uttering cries, and many other signs of bad weather, they are at least very doubtful; whilst the adage about the pig which credits him with seeing the wind, carries with it its own condemnation. The medicinal leech is still left on the list of weather prophets, though he has no doubt had his powers exaggerated.

Plants have also their advocates as weather indicators; and there is no doubt that in most cases they act in sympathy with changes in the dampness, gloominess, or chilliness of the air, and as these conditions generally precede rain, one cannot term the indications altogether fallacious. The pimpernel and the marigold close their petals before rain, because the air is getting damper, while the poplar and maple show the under surface of their leaves for a similar reason. Indeed, an artificial leaf of paper may be made to do the same thing, if constructed on the same principle as the natural one—a hard thin paper to represent the upper side of the leaf, and a thicker unsized paper for the lower side; these will, if stuck together, curl up or bend down in sympathy with the hygroscopic condition of the air. A slip of ordinary photographic paper will do the same, and will curl up at once when placed on the hand.

In 1892 attention was directed to a plant, the *Abrus precatorius*, a beautiful shrub of the mimosa kind,* which has the property of being sensitive in a high degree, so that its pinnate leaflets go through many curious movements, and it was claimed that these form a guide of unerring certainty to foreshow the coming weather. Even earthquakes were said to be predicted by this wonderful plant. If it closed its leaflets upward, after the manner of a butterfly about to settle, fair weather was shown; when the leaflets remained flat, changeable and gloomy weather was indicated; while thunder at various distances was to be foretold by the curling of the leaflets, and the nearer the thunder the greater the curl, until when the points of the leaflets crossed, the thunderstorm was indicated as being overhead. Changes of wind, hurricanes, and other phenomena were to be shown by the various curious and beautiful movements of the leaflets and stalks. These movements undoubtedly took place, but when the plant was submitted to the unprejudiced observation of Dr. F. W. Oliver and Mr. F. E. Weiss, at Kew Gardens, those gentlemen failed to find any connection between these movements and the weather, and Dr. Oliver made a report on the matter, which hits the heart of the whole subject of plant movements, by ascribing them for the most part to the agency of light and moisture. Mr. Scott, of the Meteorological Office, gave the finishing stroke to the theory by proving that the movements had no connection with either cyclones or with earthquakes, so that the sensitive plant may be considered as out of the list of weather guides, in spite of having been made the subject of an English patent."

The discharge of cannon as a means of producing rain is also discredited and to various other ideas, generally accepted, Mr. Inwards applies

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* Very common in Colombo gardens, with its pretty scarlet and black seeds.—Ed. *T.A.*

the dictum,—'and this too is fallacy.' As for those who "prophesy" they are denounced as a generation of false prophets. The paper is destructive, not constructive and when the reader, driven from his strongholds of belief, asks what have we then to reply on, Mr. Inwards says:—

"I would venture to refer him to all the patient work which is being done in various countries, and by which a real Science of Meteorology is being slowly built up, while to the outdoor weather student I would offer this consoling reflection—There is still the sky."

Some people will say, we ask for bread and these philosophers give us a stone! But this would not be fair; for in the Meteorological returns available even in Ceylon, much may be learned in working out averages, and in noting exceptional seasons as to rainfall, temperature, &c.

WHAT REMAINS OF COFFEE IN CEYLON:

HOW THE 22,000 ACRES STILL UNDER CULTIVATION ARE DISTRIBUTED.

GOOD NEWS FOR PLANTERS' FROM HAWAII: "LADY-BIRDS" THERE CLEAR-COFFEE OF BUG &c.

In 1877-78, coffee reached its maximum area of cultivation in Ceylon with the aggregate close on 280,000 acres. Six years later, and no less than 100,000 acres of this extent had either been abandoned or practically superseded by cinchona, tea or other cultivation. Six years later still, in 1890, the area under coffee was returned at no more than 54,000 acres, in 1893 it had sunk to 30,000 acres exclusive of about 2,500 acres under the Liberian variety and now (Sept. 1895) it has gone down to 22,000 acres besides 3,000 acres of Liberian coffee. So great a transformation in agricultural enterprise within a period not much exceeding half-a-generation—as such is reckoned in temperate zones—has surely never been witnessed in the world's history before.

It is of interest at this time to know over what districts in Ceylon the 22,000 acres that remain of the old staple—coffee *Arabica*—are distributed. North as well as South of Kandy, in districts that were once the stronghold of the coffee bush, scarce an acre now remains! For the Knuckles, Rangala, and Nilambe districts, for instance, no return whatever is made by a single planter,—under coffee the record is absolutely *nil*. It is no better in Ambagamuwa, Medamahanuwara and Lower Dikoya; while only a very few acres appear for Kelebokka, Hunasgiriya, Dolosbage, Pussellawa, Ramboda, the Hewahetas, and Kotmale. Dumbara, Hantane, the Matales and Pundaluoya show a little more; but altogether in the Kandy districts proper, between Ramboda and Matale and Dolosbage and Medamahanuwara, once the mainstay of the coffee enterprise, with perhaps 100,000 acres under cultivation, the total under coffee now does not exceed 3,500 acres!

We now come to the three higher districts between Adam's Peak and Great Western, which could—fifteen to sixteen years ago—show over 80,000 acres cultivated with coffee. Here is the return for the present day:—

Dimbula	-	2,109	acres	coffee
Dikoya	-	1,535	do	do
Maskeliya	-	160	do	do
Total	-	3,804	do	do

We then come to the Principality—to Uva and its allied districts—in which, for our purpose today, we include Maturata as well as Udapussellawa, and although compared with the maximum return fifteen or even ten years ago, our figures show a woeful decrease—still, it is a matter of satisfaction that so much good coffee remains, especially in Haputale, and still more that in place of every acre superseded, we have full compensation in flourishing tea or cacao. Uva could at one time boast of well-nigh 50,000 acres of coffee. Here is now the record with some extra districts:—

Haputale	-	6,119	acres	coffee
Haputale West	-	507	do	do
Badulla	-	2,419	do	do
Passara	-	1,222	do	do
Madulsima and Hewa Eliya	-	921	do	do
Monaragala	-	143	do	do
New Galway	-	114	do	do
Udapussellawa	-	1,449	do	do
Maturata	-	480	do	do
Total	-	13,374	do	do

Or let us say 13,500 acres which is equal to nearly two-thirds of the whole coffee extent in the island. Moreover, we are glad to learn that in certain parts of Uva, (as in Dumbara successful clearings with the old staple with the Liberian variety—are being established, while the greatest care is being taken of the fields that remain. Considering the continued high price of coffee and good crops recently gathered, it is scarcely to be wondered at that this should be the case; but there is a further reason now for conserving coffee in the news just received from Honolulu that lady-birds there are killing the enemies of coffee.

As regards Liberian coffee, the 3,000 acres cultivated are chiefly distributed between the Kurunegala, Kegalla and Polgahawela, Matale North and West and certain low-country districts; but there is no reason why a considerable extension should not take place. We hope to hear of further experiments being made with the Nalkanaad-Coorg and Mysore-hybrid coffees, as also with the hybrid between the Liberian and Arabian kinds reported some time ago to have been established in the Peradeniya Gardens.

INDIAN AND CEYLON TEAS.

Mr. W. D. Gibbon, homeward-bound, drops a note to us as follows:—

S.S. "Malta," Suez Canal, Sept. 1.—"We hope to be at Port Said at 12 noon after a very uneventful journey. The "Malta" is a most comfortable boat. I understand from a London buyer of tea just returning from Calcutta that buyers there have lost money by their purchases the London market for Indian teas being dull. Indian tea was nothing like the quality it had last year. The season has been bad, but the increased area coming into bearing will keep up the quantity so far as output is concerned. My informant, who says he has *no prejudice* on the subject, maintains that the keeping quality of Indian tea is far superior to Ceylon, and that there is a salty flavour in Ceylon tea not perceptible in Indian nd which he tries to account for owing to Ceylon being an Island."

COFFEE, CACAO AND SHADE IN THE DUMBARA VALLEY.

In connection with our Handbook Planting Review, it is of special interest to learn how experiments with new or old products are proceeding and so we want to know from time to time about those in Dumbara with Coorg coffee mixed with cacao and all under shade, first begun on Kondesalle at, we believe, the instance of Mr. Hamlin and continued by Mr. Wilkinson; and also carried on by Mr. Vollar on Pallakelly. The Manager of Kondesalle has accordingly obliged us with the following very useful reports:—

Kondesalle Estate, Kandy, Sept. 21st, 1895.

Dear Sir,—I have with the exception of one year, opened land in Arabian coffee and Forestero cacao and shade yearly since 1888.

All the coffee planted on this estate has paid well, especially the 40 acres clearing planted in July 1892, which last year gave a crop of almost 4 cwt. per acre and this year may give quite 1½ cwt. per acre, perhaps 2 cwt. per acre. This field is shaded with dadap. My previous clearings were shaded with the Coorg fig *i.e.*, *Ficus glomerata*, which I do not believe in and am of opinion that from the experience I have had the *Ficus glomerata* does not suit coffee as well in this district as I am told it does in Coorg. It certainly does not suit cacao except in occasional patches.

Although Arabian coffee has done so well on Kondesalle and Pallekelle, I know of four instances on other estates in another district where it has even on better soil, proved a failure.

All our seed was from Coorg. A few acres lately have been put into Liberian.

C. H. T. Wilkinson.

[The following was written to us four years ago, but omitted to be sent for publication at the time.]

July 24th, 1891.

DEAR SIR,—In the issue of your paper for 21st inst. I notice you draw attention to the coffee and cacao clearings on this estate under the heading of "Coffee Planting in Dumbara." There are one or two errors which I should like to correct as they may be misleading to those intending to plant cacao and coffee together, so you may publish as much of this letter as you think fit. My first clearing—50 acres—was planted in June-July 1888. Coffee plants were put out, but the cacao was planted seed-at-stake. The next clearing—54 acres—was planted June-July and August 1889 in the same way.

The cacao holes are 3 feet deep, and are 10ft. by 12ft., and not 11ft. by 11ft. as you have it, therefore the coffee is 5ft. by 6ft.

If the land is really good I advise coffee and Caraccas cacao being planted together at 10ft. by 12ft. I am inclined to think that the Caraccas or red variety is a heavier bearer than the Forestero, although not so hardy. Forestero grows faster than the Caraccas and requires more space as it spreads; therefore I do not think 15ft. by 15ft. too wide apart, for if the soil be really good, even at this distance, the branches will meet in 3 or 4 years, especially if the land be flat.

In parts of my 50 acres clearing where the soil is really good the Forestero Cacaos have spread so freely that their branches already touch—so are crowding out the coffee.

If Coffee and Caraccas be planted I recommend them being planted the same year as these Cacoas do not grow quite so rapidly and do not spread so much; but if the Forestero is required to be planted, I recommend putting the coffee in alone *(without shade plants)* the first year and Cacao and Shade Plants the year following. The Coffee will have a better chance by having a year's start and I find where the shade trees have not come on well at first, the Coffee bushes are much more luxuriant.

Shade Trees in my clearing have been planted 10 by 12 *i.e.* one for every Cacao tree. This in my opinion is far too close and is not required I therefore recommend one shade tree to be put in for every two Cacaos thus:—

```
y               y               y
   o        o        o        o        o
 x    x    x    x    x    x    x    x    x
        y               y
 x    x    x    x    x    x    x    x    x
   o        o        o        o        o
 x    x    x    x    x    x    x    x    x
y               y               y
 x    x    x    x    x    x    x    x    x
```

Cacao *o*. Coffee *x*. Shade *y*.

C. H. WILKINSON.

Mr. Vollar kindly reports as follows:—"Coorg coffee was planted in Dumbara, and at the same time cacao plants were also put out. Upshot:—got one or two good crops of coffee which more than paid all expenses of clearing and left a fair profit, and then the cacao trees overshaded the coffee and snuffed it out. From what I observed, I have no belief that the coffee would have lasted or gone on giving good returns, if it had had its own sweet will, but it was a splendid catch-crop. We have still a fringe of coffee along the roadsides, which gives a fair crop every other year."

DR. TRIMEN'S "FLORA OF CEYLON."

We have to acknowledge the receipt of Part III. of this valuable work accompanied by 26 coloured plates executed in Messrs. Dulau & Co.'s (the publishers') best style. Reserving an adequate notice with examples of the information of general interest afforded, we quote for the present, the title page of the volume:—

A hand-book to the Flora of Ceylon containing descriptions of all the species of flowering plants indigenous to the island, and notes on their history, distribution, and uses by Henry Trimen, M. B. (Lond.), F.R.S., Director of the Royal Botanic Gardens, Ceylon. With an Atlas of Plates illustrating some of the more interesting species. Part III. Valerianaceæ—Balanophoraceæ with Plates Li—LXXV. Published under the authority of the Government of Ceylon. London: Dulau and & Co., 37 Soho Square, W. 1895.

Among the more striking of the plates are:—"BARLERIA ARNOTTIANA, *Nees*, VAR. GLABRA, *Trimen*"; a double page with "IPOMEA JUCUNDA," *Thw.*; "IXORA JUCUNDA," *Thw.* with its dark-green leaves, red stems and wealth of white flowers; "WRIGHTIA FLAVIDO-ROSEA," *Trim.*; etc

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HOOLANKANDE ESTATE, KELEBOKKA.

The price paid for this property the sale of which to the Earl of Glasgow (Governor of New Zealand) was recently announced is £12,750. The acreage is 668 of which 355 in tea, 40 in timber, rubber &c.

THE TEA "RING" OR MONOPOLY IN CALIFORNIA.

We can use no other term than the above after reading the following circular letter handed to us by a Colombo merchant. No doubt San Francisco tea dealers would prefer that there should be no intrusion of a new and better article such as Indian and Ceylon teas, seeing that the inferior and oft-adulterated Japan and China teas, afford them a wider margin of profit. But it is just their monopoly that has to be fought and if the large dealers refuse to hold Ceylon and Indian teas, then it will be for the producers to go direct to the consumers with samples and advertisements and to let them know how they are kept out of a wholesome superior article—and a more economical one in the end. To stop the steady supersession now of Japan-China by Ceylon-Indian teas year by year in America (as in Europe and Australasia), is a task parallel to that of worthy Dame Partington in trying to drive back the Atlantic Ocean. We quote as follows:—

San Francisco, July 27th, 1895.—Whereas the practice of consigning Teas to this market, to Agents and Brokers, has been steadily increasing and in consequence threatens to be a menace to legitimate Importers, by causing serious demoralization in prices, and general injury to the trade. Be it therefore resolved, that we request all Tea Houses in Japan, China, India, and Ceylon who consign Teas to this market, to cease doing so, and to sell only on orders from the Importers direct, or by sample or orders from their Agents or Brokers, representing them in this market. Be it further resolved, that the respective Agents or Brokers be at once notified that these resolutions will go into effect after due time has been allowed for communication with their Principals.

CASTLE BROTHERS,
J. A. FOLGER & Co.,
TILLMANN & BENDEL,
S. P. LAUINGER
Secretary.
MCCARTHY BROS.
M. EHRMAN & Co.
WILLIAM CLUFF COMPANY,
MAU SADLER & Co.
JONES & Co.
M. J. BRANDENSTEIN & Co.
A. SCHILLING & Co.
ADELSDORFER & BRANDENSTEIN,
EASTON & SCHWARTZ,
W. A. W. MATHEW.

THE TEA PLANTING INDUSTRY OF CEYLON IN 1895:

THE POSITION IN RESPECT OF ALTITUDE AND GROUPS OF DISTRICTS; INTERESTING ANALYSES.

THE RESERVE AVAILABLE FOR TEA.

Just as we have pointed out the locatiou of what is left to us of "Coffee," so it may be well briefly to bring uuder review the great divisions or centres of "Tea" cultivation in the island. We may indeed be told that tea is everywhere, or be asked where it is uot, within the recognised Plautiug divisions of the Mountain Zone and much of our South-Western lowcountry; but by grouping certain districts together and showiug the total area in these covered by the tea plaut, we may get a much better idea of the importance of the several zones of cultivation. In doing so we may first give an approximative estimate of the area with tea from an altitude of about five thousand feet above sea-level and upwards; secondly between five thousand and down to about three-thousand-five-hundred feet altitude; thirdly from the latter limit to say two-thousand feet; fourthly between two and one thousand feet and fifthly under a thousand feet altitude and iu the low-country proper. Premising that the aggregate area plauted for Ceylon is taken according to the latest Directory returus, at 305,000 acres, *plus* 5,000 acres in native gardens not iu our lists, our estimate of approximative areas at the different altitudes works out roughly as follows:—

	Feet.		Feet.	Acres.
Tea above (or close on)	5,000	about	...	30,000
,, ,,	3,500	and under	5,000	151,000
,, ,,	2,000	,,	3,500	67,000
,, ,,	1,000	,,	2,000	24,000
,, under	...		1,000	38,000
			Total..	310,000

Next we may attempt some grouping as respects districts. Taking first the great expanse of cultivation between Great Western and Adam's Peak and including Lower Dikoya, we get of tea planted, as follows:—

	Acres.
Dimbula - area under tea	41,901
Dikoya ,,	26,731
Dikoya Lower ,,	7,996
Maskeliya ,,	18,547
Total	95,175

Or, not far short of one-third of the total area planted in the country, and certainly by far the most valuable third. Let us by way of contrast place the Uva group of districts, going as far as Maturata and Nuwara Eliya on the oue side and Balangoda—though this may seem rather beyond the Uva climate—on the other. We then get a return as follows:—

		Acres.
Haputale	area under tea	11,630
,, West	,,	1,197
Balangoda	,,	3,412
New Galway	,,	881
Udapussellawa	,,	8,289
Maturata	,,	5,139
Badulla	,,	8,579
Passara	,,	3,560
Madulsima and Hewa Eliya	,,	6,609
Monaragala	,,	245
Nuwara Eliya	,,	3,600
	Total	53,141

Here we have over one-sixth of our total area under tea; but then it must be remembered that in this divisiou there are also 13,400 acres of coffee and an appreciable area of cinchona against only 3,800 acres of coffee and very little cinchona in the Dimbula-Dikoya group.

It may be well next to show the area under tea in the districts North and South of Kandy respectively. In the Northern, North-Western and North-Eastern divisions, we have:—

	Acres.
Matale East & Laggala—area under tea	7,439
Matale West	3,095
,, North	1,289
Kelebokka	4,387
Knuckles	4,095
Nitre Cave	329
Rangala	4,595
Medamahanuwara	988
Hunasgiriya	2,859
Panwila and Wattegama	1,913
Dumbara	60
(And let us add) Kurunegala	1,368
Total	32,417

Or not far off one-ninth of the whole extent under tea and less than half the acreage included in the next group. South and West of Kandy, we place:—

	Acres.
Hantane—area under tea	4,840
Hewaheta Lower	4,004
,, Upper	4,228
Nilambe	4,991
Pussellawa	12,211
Ramboda	3,637
Pundaluoya	3,345
Kotmale	8,198
Ambagamuwa	5,992
Yakdessa	1,761
Dolosbage	14,174
Kadugannawa	3,375
Alagalla	2,453
Total	73,209

This takes the second place, the proportion being nearly oue-fourth of the whole.

Finally, we may give all that remain together as "Lowcountry," although the Rakwana, Kukulu and Morawak Korale districts are scarcely in that category:—

	Acres.
Kelani Valley—area under tea	22,322
Kegalla and Polgahawela	1,350
Kalutara	10,453
Udagama	3,970
Other Lowcountry Districts	3,749
	41,844
(Considerably higher.)	
Kuruwita	1,262
Rakwana	3,145
Morawak Korale	3,168
Kukulu Korale	1,053
Total	50,472

In this total we have very nearly oue-sixth of the grand aggregate for the island; but as time rolls on, if only encouragement is offered through prices keeping up, we may expect the lowcouutry to show a further considerable development.

We have been asked by a Colombo merchant to state what proportion, according to our reckoning, of the reserved land in private hands may be available for planting with tea. The total extent of plantations being ... 748,017 acres and of cultivation ... ... 379,182 ,,

We get for total reserve ... 368,835 ,,

Of this very large extent we should say that about 120,000 acres represent forest and other valuable land fully available for cultivation if due encouragement is offered; and unless a fall in the price of tea through large crops in India interfere, we see no reason why 60,000 acres of this reserve should not be planted during the next five or six years—apart from any Crown land that may be made available—*so let Indian tea-planters beware of supposing that there is no more tea land to plant in Ceylon.*

SUPPLEMENTING TEA WITH COFFEE IN N. INDIA.

First as regards the elevation required for growing coffee in the Bengal Presidency. We can start from the low country, where there is good drainage, to any fairly sheltered elevation below frost zone. There are a few coffee trees in Calcutta, but we will cite Rangoon, some 8 deg. south of it, where may be seen over an acre of coffee in their Botanical Gardens some 20 years old grown in "Native" fashion—cropping on suckers. Owing to want of method, it crops heavily every two years. There is no pampering, rather an intentional neglect to wisely prove that it thrives under difficulties. In Bengal we have the advantage of being—roughly—8 deg. north of Rangoon, where it thrives on the plains. We have a rainfall averaging 65 inches in the year, falling in the months best suited for coffee. A dry winter and spring, and showers in April, with a wet October—this last matures berry and future bearing wood. Coffee, like tea, will not do on a wet subsoil. —*Indian Planters' Gazette*, Sept. 14.

[And then follows practical advice.—Ed. *T.A.*]

THE PREPARATION OF CAMPHOR.

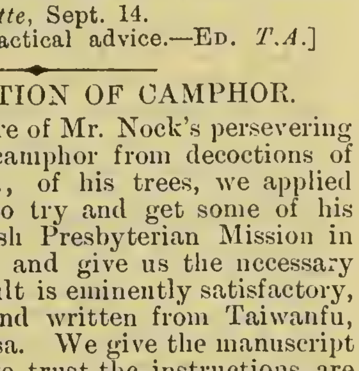
In view of the failure of Mr. Nock's persevering attempts to collect camphor from decoctions of the bark, twigs, &c., of his trees, we applied to Mr. R. Porter to try and get some of his friends of the English Presbyterian Mission in Formosa, to compile and give us the necessary information. The result is eminently satisfactory, in the paper we append written from Taiwanfu, the capital of Formosa. We give the manuscript account in full and we trust the instructions are simple and clear enough to enable Mr. Nock to utilise them in a fresh experiment; there are three little sketches—of the furnace, the style of chips, and the beaten wood—which we also have had reproduced:—

THE METHOD OF PREPARING CAMPHOR IN FORMOSA.

The method employed in Formosa for preparing camphor is very rough, and consequently not very economical.

I myself have not seen the process but have heard it described by several persons, particularly by the man who first had to do with this work in Formosa.

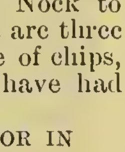
The apparatus and operation are as follows:—



1. A fire-place is built and a shallow iron vessel (the kind used in Formosa for boiling rice) inserted therein.

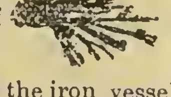
2. The walls of the fire-place are carried up a short distance and a meshed frame placed across the opening.

3. A large earthenware vessel is placed inverted over the top. It is made to fit more or less closely to prevent (as far as is safe) the escape of vapour.



4. The pieces of wood are chipped off from the tree with an adze diagonally to the grain.

5. Each piece of wood is then beaten till it splits more or less up along the grain. This is to expose the surfaces where the camphor lies. Some of the pieces of wood are about the size of one's hand, or less. The slices are not very thick.



6. Water—not too much—is put into the iron vessel.

7. The prepared pieces of wood are placed on the top of the meshed frame.

8. A wood or charcoal fire is lighted under the iron vessel. It must be a slow fire and the water must not boil violently.

[The idea seems to be like that in the making of beef-tea with steam, the water from which is generated being allowed only to simmer.]

9. The steam goes up through the grating or meshed frame and then through the pieces of wood. It gets impregnated with the camphor which is deposited in the inside of the inverted earthenware vessel.

10. The wooden chips are changed about every twelve hours, the exhausted ones being taken out and fresh ones put in.

11. The process goes on continuously for several days (nights included.) A sufficient quantity of camphor is obtained after six or seven days, but it is soft and apt to run into an oily fluid. To get a good hard quality the process should in all last about ten days.

12. When the camphor is properly ready, it is scraped off from the inside of the earthen vessel. This is the camphor of commerce, not the refined kind sold by chemists.

George Ede, E. P. Mission, Formosa.

A NEW TURBINE FOR GEEKIYANAKANDE ESTATE.

The Colombo Commercial Company are erecting a new turbine on Geekiyanakande estate, Neboda. The turbine is of Gunther's partial injection type, and is so constructed as to suit the requirements of both the wet and dry seasons when the supply of water will vary. The horse-power is 25, but the turbine could be efficiently worked even at 3 h. p. The fall of water is 70 feet, and the machine passes 250 cubic feet of water per minute. The pit is 45 ft. deep, the excavations made through rock being at a depth of 22 feet, the upper portion—23 feet—only, being through earth. The diameter of the pit is 6 feet 8 in. and the upper part is lined with 9-inch brick lining. The vertical shaft has a revolution of 240 turns a minute. The tail-race is 2½ chains in length—the cutting of the first two chains being through solid rock. This has been the first instance in Ceylon of such a deep turbine-pit. Work is now in full swing, and will be completed shortly.

COFFEE IN THE NORTH OF QUEENSLAND.

It is an interesting fact that the Cairns district can now boast of the largest area under coffee in the whole of Australia. As a result of the enterprise of Messrs. Swallow Bros., of Hambledon Plantation, thirty-five acres of their estate have just been put under the coffee plant, there being 34,000 trees of the Arabian and 1,000 trees of the Liberian variety. It is anticipated that in from two to three years the thirty five acres will give a total of about thirty-one tons of coffee beans per annum, which at the wholesale rate of 1s. per lb., represents a gross return for the thirty-five acres of £3,500 per annum. The seed from which the young plants were grown was obtained direct from Ceylon. We always thought there was "money" in coffee culture, these facts show it. Other agriculturists north-wards should follow this example!—*Australian Tropiculturist*, Sept 2.

FOREST-THINNING.

Mr. J. A. Manton, who is in charge of the forest-thinning operations in the Murray district for the New South Wales Government, reports that the total area thinned to date is 50,500 acres. The average number of trees left is about 250 to the acre, and it is assumed that at least 100 will grow to marketable timber during the next 35 years. Placing the market value at only £1 per tree there will be a return of at least £100 per acre in 35 years. The cost of the thinning operations so far has been 5s 2d per acre.—*Australasian.*

LIBERIAN COFFEE IN WYNAAD.

Kadur Dist., Sept. 19th.

Sir,—May I hope for a reply to the following queries from some of your numerous readers? About what should be considered "a good maiden crop" per acre from Liberian coffee growing at an elevation of 1,000 feet and planted 10 ft. apart—and also at what age may the first crop be expected?—ENQUIRER.

II.

Vayitri, Sept. 20th.

Sir,—As promised in my letter appearing in your issue of the 4th instant, I have now to inform "Toda," that the first shipment of Liberian coffee from this district was sold in London on the 19th ultimo and realised 84s per cwt. The consignment being a small one, the price is, I think, fairly satisfactory, and just 10s more than that secured for the coffee (grown in the lowcountry and erroneously marked Wynaad) referred to by "Toda" in his letter of the 3rd August last. It may interest "Toda" also to learn, that the outer husk or pulp, if carefully dried, finds a ready sale on the coast, and adds very materially to the value of a Liberian Crop. R. LAMB.

III.

What's all this pother about the elevation of Nellacota? There is little doubt but that "Liberica" would *grow* at the top of Needle Rock if it could only find a footing there. The question we would like to have settled is, as to whether the said "Liberica" would bear paying crops of coffee at 4,600 feet or so above sea-level? That the tree has borne heavily and given half a ton and more of high-priced coffee per acre at about 2,600 feet elevation in Wynaad, seems to have been conclusively proved. It would now be very interesting to know how much coffee per acre may be expected from trees growing at 4,600 feet and over, or, well, let's say in the clouds or somewhere near the frosty regions! in a locality rather foreign to the habitat of "Liberica," which loves rather the hotter and more forcing climate to be found at a comparatively low elevation. I trust, however, that the "Liberica" at Nellacota may reward the enterprise of its planters by proving highly successful and remunerative.

Manantoddy Club, 23rd Sept. EXCELSIOR.

IV.

As the elevation at which Liberian coffee will grow and crop well is, I believe, of much interest to many, kindly allow me a word in reply to "Nilgiri Wynaad," whose letter appears in your issue of the 19th. He impugns my recorded tests by aneroid on the ground that such tests can be comparative only; but having found out by a reference to Mr. Borough Smyth's map, that the highest point of Needle Rock is there given at 4,600 feet, he takes it for granted that is the highest point of the range, and at once draws an imaginary line from thence to where he supposes "Toda's" Liberians' to be growing; and another imaginary line to Avondale Bungalow, which he supposes to be the highest point of Avondale estate. Against his imagination, I think my aneroid tests can be fairly placed. Such tests, I believe, are generally accepted as good enough for practical purposes—admitting their variations are understood, and allowed for. There is a trignometrical survey point at either Needle Rock Peak, or Rockwood Peak. Aneroids set at sea level, I should think, would be found to agree very closely to that determined point; but I have not, though it is necessary to climb to the top of either Peak, in order to be able to rectify, possibly, a difference of a few feet. I leave that for "Nilgiri Wynaad" to do. As he says, no one will deny that Needle Rock Peak (or the highest point of the Needle, to be absolutely correct) is the highest point of the Range, he may be surprised to learn that it is not, but that *Rockwood Peak* is. Nor is Avondale Bungalow the highest point of Avondale Estate to which I alluded. "Toda" has admitted to me that he ought to have written 4,000 instead of 5,000 feet, as being the elevation his Liberians are doing so well, and I understand him to be of opinion that Liberian might even be found to crop at 5000 feet. I agree with him that his Liberians are cropping at about 4,000 feet. We have the testimony of Mr. W. C. Dawson that they are doing ditto on the Bramagherries at 4,100; and it would be interesting to know whether other testimony of this variety cropping at even higher elevations could be adduced. I am inclined to the opinion of "Toda," without fixing so high a limit as 5,000 feet, but they might be found to crop well at over 4,000 feet. "Nilgiri Wynaad's" belief would probably not have found expression, had he been better posted up in local knowledge. H. SHELDRICK.

—*M. Mail*, Sept. 23rd.

BRITISH CENTRAL AFRICA.

We have the official *Gazettes* from Nyassaland of July 1st and 15th. The first is full of Customs regulations; but in a Supplement we get some exciting news about lions:—

It is stated that a troop of lions made a determined attack on the cow-byre at the Mission Station at Blantyre the other day, and killed three cows. The increasing boldness of those animals is extraordinary and is probably due to the extinction of the game in the more settled Districts of the Protectorate. A few days ago one of the Zanzibari policemen at the Ntondwe post on the Zomba road met a lion walking up the same road in close proximity to the post. The lion was between the man and the little fort and stood his ground, not at all inclined to give way. The Zanzibari therefore fired at and wounded the lion who however charged him and the man received him on the point of his bayonet. Nevertheless, the lion managed to free himself, and though very severely wounded made off into the bush. In the struggle the Zanzibari had one of his toes torn off by the lion's claws. Otherwise he was uninjured, but the nervous shock was so severe that for some days he was incapacitated from duty, and would not leave the fort under the belief that the lion was lying in wait for him.

Major P. W. Forbes arrived at Zomba on the 23rd June to see H.M. Commissioner in reference to the taking over of the Administration of the British South Africa Company's Territories north of the Zambezi. The transfer of the Administration from the Commissioner to Major Forbes will have been completed by the date on which this Gazette is issued.

Major Forbes proposes to start in July on a tour of inspection round the Chambezi, Tanganyika Mwera and Luapula Districts. He hopes to be back in Blantyre in about two and a half months from the date of starting. Major Forbes proposes to make his headquarters at Blantyre for some time to come, as besides the administration of the Chartered Company's sphere he is charged with the completion of the Telegraph line from Blantyre to Tanganyika. No immediate alteration in the Administration of the Company's sphere is contemplated.

The latter paper has articles about Angoli Labour and Coffee and the following paragraphs:—

It is interesting to notice the atttention which the more intelligent of the native chiefs are now giving to the planting of coffee &c. Coffee planting has been started in the Marimba District by some of Jumbe's old headmen. Magnificent crops of potatoes are now being raised by the chiefs and headmen in the Zomba District, and those brought in for sale are superior in size to the best that can be turned out in our European gardens at this place. All these potatoes are derived from seed distributed amongst those chiefs by Mr. Whyte, two and three years ago. Unfortunately, the experiments with wheat were marred by the locusts, and it is to be feared that the natives are rather discouraged from planting corn for some time to come,

EXPERIMENTS WITH TEA IN CEYLON 26 YEARS AGO.

[I send some notes on tea written by Mr. A. C. H. of Rangoon, formerly a planter on Mount Temple Estate, above Gampola, which it will be interesting to publish. He is a very clever and original man, but unlucky in his speculations. At present he has a rice mill, and is preparing Burma rice in the same way they prepare it in Madras, steaming it to make Calunda rice, and is the first to introduce that system of preparing rice into Burma, which may benefit the rice growers there very much. He is very sanguine about making a fortune over it.—*Cor.*]

9th Aug. 1895.

In 1879 the following experiment was tried on five year old tea bushes by a restless spirit whose notions are out of the beaten track. A few old women were, after picking the usual flush of young leaves, set to strip every leaf off a certain number of bushes to ascertain what kind of tea could be made from the hard leaves.

About 8 trees a piece was all the old women got through, each tree producing as its total crop, over a pound weight.

The leaves were too dry to wither, roll, or ferment; the question was: what to do then?

A large-sized sausage machine being available the leaves were put through it, and cut up; they were then sprinkled with water, plenty of it, and with some trouble of attempted rolling (and palming, patting or pounding) got to adhere in the form of balls. In this state a certain amount of fermentation was set up, even to a reddish-green colour, and the tea was in due course fired, put into paper packets of 1 lb. each, and put aside for sale to natives who occasionally came for tea at 1s 6d each.

The originator of the experiment forgot it until some weeks after, a neighbour who turned up his nose at the very idea of Ceylon tea, ran out of his imported stuff and wrote over asking as a favor to be spared a few pounds of tea. By way of paying him off for the contempt he always exhibited with regard to the production of Ceylon tea, a couple of paper packets of the production in question were sent to him with a note saying that this was some rubbish sold to natives at 1s 6d a pound, and was the only tea available at the moment.

In the course of an hour or two an acknowledgement was received to the effect that the sample sent was the finest the writer had ever tasted, and he would be only too glad to buy every pound available at 1s 6d! So much for tea made from what 99 planters out of 100 consider of no value, because the remaining one has said so.

Twenty-seven days after that stripping, every bush treated threw out an abundant flush of pekoe tips or about *ten* times the quantity that any ordinary bush would yield under ordinary circumstances. At a rough calculation an acre of tea if stripped say twice a year would yield fully 800 lb. of tea from hard leaf. From only pekoe tips two pluckings, 50 lb. and more than its yield of average tea during the other 10 months in the year, because all the young leaves would be tender enough to manufacture if advisable.

The late Dr. Thwaites on being consulted, gave his opinion that stripping should not be resorted to "too often."

The question induced by the result of this experiment is "Does the Tea Planter under the prevailing system derive one quarter of the profit from his tea trees that they are capable of yielding" the answer is, if you have full-grown bushes why not prove it?

A. C. H.

[We suspect that after each successive "stripping," the bush would prove less and less readily responsive and would in fact soon begin to show signs of suffering.—Ed. *T.A.*]

HOW IT STRIKES AN OLD COLONIST. MOROWAKA REVISITED; THE COMING RESURRECTION OF BURIED SOVEREIGNS.

Passing along Craven Street a few months ago, I observed a brass plate bearing the words "Morowakkorale Tea Company, Limited."

The doorway had long been familiar to old Indian and Ceylon men, mercantile, civil and military, and perhaps was more frequently and hopefully entered in the olden time when the quaint little street came to a *cul de sac* ere reaching the bank of the Thames, than now when it is an open and busier thoroughfare.

Morowaka seems better known in London than it is in Colombo. "Where on earth is Morowaka?" said a leading Estate Agent the other day and as there are doubtless many in Ceylon equally ignorant of our southern hills, a brief record of the district's history during the past 30 years may not be out of place.

The Morowakkorale proper lies wholly within the Southern Province, though several of the estates such as Hayes, Valleyfield, Panilkande, &c., are within the limits of Sabaragamuwa, about 40 miles from Matara—60 from Galle and 112 from Colombo, by such roads as are now available and those who complain of them ought to have "seen those roads before they were made."

The railway journey to Galle from Colombo unnecessarily tedious as it unquestionably is—taking four mortal hours to cover what in my native country would be accomplished in about 1½ hour. Still it is an improvement on the old coach, though the journey may be more monotonous. We are not now and then landed in the ditch we get no mullagatawny at Bentotta. Albeit there is a considerable saving and for this we are duly thankful. In a few weeks more the line will be opened to Matara bringing us ten miles nearer our destination.

To anyone like myself who 30 years ago crept up from Akuresse through jungle paths,* the present carriage drive seems splendid, and indeed it is a very creditable trace—but passes through a very poor and sparsely peopled country. There are no valuable forests and the greenery existing such as the bracken, only serves to show the poverty of the soil. Here and there the pretty and curious pitcher plant hangs over the steep embankment indicating a very moist and warm climate. The purple variety, by the way, only supposed to be found in Borneo, is here not uncommon. A few miles before reaching Akuressa —or about 20 miles from Galle—we come upon the first tea estate, a poor jât in a poor soil, but such is the result of 150 inches of rain per annum in a hot climate, that the flushes seem fairly good.

AKURESSA

itself, with its comfortable bungalow, its pretty clump of teak trees and its navigable river, forms the only real oasis in this lowcountry wilderness. The road thence to Deniyai—29 miles—affords little worthy of note save the welcome and very pretty Resthouse at Morowaka where one can always get an easy chair, a refreshingly long drink and see such familiar objects as a copy of the *Tropical Agriculturist* and Sandy Brown's picture hanging on the wall.

ARRIVED AT DENIYAI

where the frogs perpetually croak, the wearied travellers feel only fit to follow their example. There is not much to eat, less to drink; but we bless the Government Agent whose forethought had provided such splendid beds. Deniyai though barely 1,000 feet above sea level is cooler than Kandy, and we sleep as only moderately tired men with fairly good consciences can. Feeling refreshed next morning we start for a walk of 5 miles into the heart of the old coffee district; but before we had travelled a mile we had entered upon a tea watte of considerable extent, at the entrance into which stands a substantial stone and lime Church dedicated to St. Joseph built by the prosperous native

* Our first and only visit to Morowakkorle and across Gongalla to Rakwana was in 1872.—Ed. *T.A.*

proprietor of the watte. The watte of about 100 acres showing a fairly good cover of—I am sorry to again add—rather poor jât, making up in flower what it fails to do in flush.

THIS QUESTION OF JAT

is by the way one of the most tender topics that a visitor can touch in Ceylon. It took the pucka planter 6 years to arrive at its immense importance and he is loath to think that any occasional interloper should so far profit by his dearly bought experience as to become in 6 weeks an authority on the mysteries of Manupuri *v.* the so-called Singlo-hybrid. The bare possibility of any one seeing at a glance the superiority of pure indigenous, acts like wormwood on the man who has daily to look at his poor degenerate China jât and think "what it might have been had he but known."

The fact, however, seems to be that the produce of the purest and best seed-bearers deteriorates after 7 or 8 years, like most things in the tropics. Even planters themselves get musty and it would well repay proprietors to give them a change home every 8 or 10 years in order to rub off the rust.

But all this by the way. As we trudge along the 5 miles from Deniyai to Anningkande, where, after a hospitable reception, I am ready to stretch myself in the Verandah and tell all I know of

MOROWAKA AS A PLANTING DISTRICT.

It was in the very early sixties that in company with my most amiable of friends, W. Hay Wodehouse the Temple Lands Commissioner, I first visited Morowaka, viewing it from the ridge above Berlepanatra, an unbroken range of forest save where the natives had nibbled away portions for koorukan or hill-paddy, and we pictured then and there the smiling homesteads that might some day be dotted over these verdant slopes. The natives were not numerous nor very bold. "All you who have never seen white men, now's your chance" was the message that was sent through the village by tuck of tom tom, and they came 'keeking' at us very timidly with hand on mouth, lest their breath should pollute us. Alas they are not quite so respectful now!

My next visit to the neighbourhood was with the redoubtable

J. W. BIRCH

—"poor Colonial Birch," as H. O. Russell delighted to dub him—a different type from the polished Woody—or the aristocratic Russell; but a most useful and energetic public servant, albeit his manner of treating the natives was rough and ready in the extreme.

"*Koorumba!*" he called out as we came panting upon a Colonna village; but thinking he was only a Rakwane planter, the owner of the watte hesitated, when, immediately, the edict went forth that this man's garden be stripped of every green thing. "I'll teach him hospitality," said B. as his followers literally carried out his instructions.

We encamped for the night on what is now known as the Panilkande flat, and early next morning as B. was bewailing the chenaing of so much fine forest, a native headman crept up salaaming and unfortunately began to complain of the inroads of a surveyor upon what he considered his inherited territory. B. was in no mood to listen to such grievances, and turning upon the aratchy he exclaimed, "You think—you thief,—that because you have been permitted to look at those hills all your lazy life they belong to you," and ended by administering such a castigation as headmen had never heard of. This now brings us to the days of Surveyor John Grinlinton, whose flowery description of the ferns in these valleys caused the Government of the day to raise the upset price of the land by 100%.

But before this—(1863)—Lemarchand and Clark had discovered and slyly secured a large slice of this *Eldorado*, quickly followed by Captain Bayley, Blyth and others; but the big purchase at £0, (£20) per acre was by J.R.H. for his Craven Street friends.

Anningkande was the first opened, and I well remember zig-zagging over from Berlepanatra to find C. G. Bury at work clearing, and who in the evening entertained me with the story of

HOW HE DID THE FISCAL IN THE CENTRAL PROVINCE.

Worried by unfortunate duns of the A. Saibo order, B. had made up his mind to seek relief by flight into the wildest and least accessible of new planting districts, but before starting determined to give his friends—the provision dealers—one more good order, and his brother planters a parting spread. Summonses to attend Court had been treated by B. as a joke. So on the eve of flight, as bad or good luck would have it, a warrant was issued and two belted peons were despatched to apprehend his body. These arrived just as dinner was announced; but the host took them aside and talked them over with such tact that they consented, nothing loath with such a prospect before them, to lay aside their belts and assist to wait at table! So fully entering into the humour of the thing, they ate and drank as much as any doray, feeling sure all the same that they would have their man in the morning; but long ere they awoke B. was trudging up through Bogawantalawa *en route* for Sabaragamuwa, thence to this back o' the world called *Morowaka*.

Several more planters of the same jât followed till Morowaka became rather noted as a refuge for harassed debtors; but somehow proprietors began to discover that these were not the best type of men to develope successfully a new district and as one by one they were shunted or died off, their places were filled by the best and most trusted planters the C. P. afforded. And now we come to the time when Morowaka first had a fair chance

AS A COFFEE DISTRICT,—

when steady, faithful and practical men like S. LeCocq, A. T. Rettie, R. Morison, &c. entered upon the stage and well did they act their part. But it was of no avail. As a coffee district Morowakkorale was doomed, even before *Hemileia* put in an appearance. Those who knew the locality were well aware that (under no possible circumstances) could the life of the coffee tree be a very long one there. *Ten years* as a rule, had been its length of days as a paying product in the adjoining district of Rakwana, where any attempt to prolong its life by high cultivation only prolonged the misery. This was sufficiently exemplified under the liberal cultivation of C. Shand & Co., and King Coffee never had more loyal or generous subjects—yet so early as 1858 the sagacious Sir. H. Ward mildly reported:—"Some of the older coffee looks thin and poor." Nevertheless there were few districts in which coffee more amply repaid the planter: the first three crops—from 30 to 40 cwt, per acre—were sufficient to cover all outlay. The mistake Morowaka men made was in despising Rakwana experience and in hoping and working for a permanency. It was in vain that economy in permanent buildings was suggested "Let us have no fears as to permanency of coffee if properly cultivated" said Craven Street,—"Look at the Hampton Court Vine, 200 years old and still bearing. If coffee fail, it is the fault of the planter whose duty it is to make the soil suitable and keep it up." All very beautiful in theory, but to those who know all about the old vine and young coffee, it sounds a trifle ridiculous.

At this stage came leaf blight, and to no district in the island did it prove a greater blessing. Would that it had been practicable to take more immediate advantage of the opportunity!—that, as in the younger districts of the C. P., the coffee had at once been supplanted by the new product. As it is, the Morowaka korale is still a somewhat sad spectacle to those who remember it in the first flush of hope. From Anningkande I can see the remains of the old Coffee Wattes spread out like a map before me. Every foot familiar ground—from the Goshen *toyal* where clever Arnold White practised his scientific manuring, to the Eastmost end where poor little Liddell did his dibbling. Right in front lies what was considered the cream of the district, where I can still see the roads so carefully traced by LeCocq, and along which I have so often wandered with that prince of practical planters. But even here no attempt has yet been made

TO GROW TEA.

The fact seems to be that the hardy new product succeeds most abundantly in lands which King Coffee despised. J. R. H. laughed his loudest when Silvakande was pointed out to him as the purchase of a neighbouring proprietor;—the representative of Craven Street *pro tem.* little dreaming that the straggling strip of forest which ran along the bottom of their estates would one day prove the veritable gold mine which would redeem their fortunes. There are in the island few finer fields of tea than this, and although there are in this district many patches equally good, it is not all Silvakandes, Campdens nor Beverleys, and much discrimination is required in the selection of suitable land. Any novice might select and successfully plant in such districts as Dimbula and Dikoya, but it requires a tropical agriculturist to discriminate here.

Immediately over the ridge lies the

KUKULU KORALE VALLEY

correctly described in the recent report of the Government Agent as "that infertile region." The valley comes in like a 'gushet" twixt Morawaka and Rakwana, contains about 10,000 acres and though for full five years I occasionally fossicked there in the hope of finding 100 acres of really good land, I had to give it up in despair. Yet during a wave of temporary insanity which passed over the island in 1872—3 the Government took the opportunity of seeing quite a number of blocks and there lie buried many a good sovereign. One can hardly sympathize with some of the investors who asked for advice and acted contrary to it, remarking it was "surely good enough to sell at a profit." Man naturally hopes that he can always find a greater fool than himself, but sometimes this is very difficult.

The only hope of a resurrection in Kukulu seems to be in Cardamoms. Once in a life-time a lucky man may pick up a gem, herbage for a herd of elephants might be found, and if leeches could be turned to account there is wealth there but beyond this the future of Kukulu is not hopeful.

From the ridge above Vegeria—which rises a little to the West of the grand Abbey Rock—may be seen some of the remains of good, old, hospitable

RAKWANA

through which I fain would now pass. "To those who know Rakwana," said Sir Henry Ward, "it is needless to speak of its hospitability." But, alas! King Coffee is gone, so too are the Dorays I knew of yore!

The time was when twenty bungalows would open wide their doors to welcome a wandering Visiting Agent, but shade of dear David Mitchell! now I know not whether the love of "Auld lang syne" would procure me the meagrest curry and rice. So with a sigh I once more turn my back on Rakwana and retrace my steps towards Galle.

BANANA FLOUR.

LIKELY TO DEVELOP INTO A VERY IMPORTANT INDUSTRY.

A good deal of attention has been drawn of late to the use of the banana as a source of flour or meal, and, though such an application is by no means new, or the discovery modern, it seems not at all unlikely that banana flour is an article that has a prospect of great development in the near future. Wherever the banana or plantain thrives, the fruits, when dry, are converted into meal, and used for making cakes, puddings, and for various other uses in cookery. An effort is being made to establish a factory for the manufacture of banana meal.

As to the use of banana flour for brewing purposes, Mr. Kahlke, one of the best known manufactures of yeast in Germany, writes in this connection: "Banana flour, without doubt, from its richness in starch and its good flavor, is particularly suitable for the manufacture of yeast. This flour is easily rendered saccharine. The yeast obtained by adding banana flour to the other ingredients has a good color, all the requisite properties of an excellent class of yeast and moreover keeps well. The alcohol obtained from it leaves nothing to be desired, so that this flour may be introduced as an article of commerce, and employed without any special preparation. Satisfactory experiments have also been made in some breweries, where 20 per cent. of malt has been replaced by the flakes and flour of cananas. The flavor of beer was not altered, and the quantity of liquid was increased, and the malt was replaced by a less expensive substance. Experiments are being made in which the proportion of banana flour is increased."—*Fiji Times.*

DEMAND FOR LOW CLASS TEAS.

It is very satisfactory to notice, writes the *Planter*, from the proceedings of the meeting of the Calcutta Committee of the Indian Tea Association, held this mouth, that the result of the stoppage of the export of tea sweepings from London to Hamburg was a demand from Germany in Calcutta for low class teas and large quantities of tea dust. This proves conclusively that the tea sweepings scandal was affecting very injuriously the Indian tea trade, and that steps were not taken too soon to put a stop to it. It would be advisable to include in the arrangements on foot to push the sale of Indian tea measures for the exploitation of the German and other Continental markets. It is of no little importance to the industry to know where our low class teas and tea dust can be largely disposed of.

LIBERIAN COFFEE.

Steadily, little by little, Liberian coffee is outgrowing the prejudice with which it has for a long time had to contend. Planters in India are beginning, here and there, to pay some attention to it, and the results in nearly all cases have been a surprise. The old feeling, "why should I bother about an inferior cultivation while Arabica is doing so well," is in many places giving place to a desire to know more about the hardy Liberian plant and its prospects. In the Straits Settlements, in Sumatra and in Java, Liberian coffee has obtained a firm foothold, and in Java, the continued recurrence of the so-called "leaf-disease" in the Java coffee on lowlying lands, from which the Liberia still preserves comparative immunity, causes more confidence to be felt in the latter; and many lands which have suffered most severely from the ravages of this disease in the Arabian plant are being re-planted with Liberian.—*M. Times*, Sept. 26.

SANDAKAN NOTES.

Continual improvement in the coffee estates is reported. The Byte estate crop for August is reported to be 33 pikuls 35 katties. Part of this crop, as "husked coffee," goes to Hongkong. This coffee has been spoken well of in Singapore and Selangor. The amount of fruit in all stages of the growth to the shrubs shows no signs of diminution, and holds out every hope of monthly crops of ever-increasing bulk for some months to come. A gentleman representing a Ceylon Syndicate is in Borneo just now, looking for coffee land. He inspected the Byte estate, and is said to have expressed a high opinion of the coffee he saw there.

His Excellency the Governor visited the gambier gardens at the back of Sandakan the other day, and appeared much pleased with the progress made in that industry.

Upwards of 60,000 coconuts have been planted here during the last twelve months, and the commercial barometer is assuredly on the rise, despite the croakings of some people who look with doubt, not unmixed with cynical smiles, at the curious *modus operandi* suggested recently in the London office of the Chartered Company for the immediate enrichment of all who are either directly or indirectly connected with the country.—*S. F. Press*, Sept. 24.

SELANGOR PLANTATIONS SYNDICATE.

The first ordinary general meeting of the Selangor Plantations Syndicate, Limited, was held on Tuesday afternoon, at the office, 147, Leadenhall-street, E. C., Mr. Ludwig Huttenbach presiding.

The Secretary (Mr. James Fitzpatrick) having read the notice convening the meeting.

The Chairman said: Gentlemen, as you have just heard from the notice which has been read, this is the statutory meeting of the company. We are compelled by law to hold this meeting within four months of the registration of the company, whether we have anything to say to you or not, and this is the very last day of grace, the four months having expired today. If that had not been the case we would have preferred to hold this meeting a little later, so as to be able to lay fuller information before you. As it is, we are not in a position to say very much. This may partly be attributed to the fact that our manager, who has been temporarily in Europe, left only on August 1, and, consequently, will only have arrived out there about a week or ten days ago, and there has not been sufficient time for him to send home any regular reports. All arrangements have, however, been made, so that immediately on his arrival out there the property would be transferred to the company. As stated, we have no recent specific news; but, generally speaking, we have no reason whatever to alter the favourable opinion, which we expressed when you were invited to take shares. I may further mention that although no formal reports have reached the directors, I have seen from private advices that things on the estates are in a very satisfactory condition. Instead of going now into further particulars, let me assure you once more, in general terms, that we are satisfied in every respect with the state of affairs, and that we feel that you are interested in a good, sound, and promising concern. I wish to emphasize once more the fact on which stress was laid when the company was formed—that Selangor is under British rule, and that we have every reason to expect that we shall be treated in all cases not only with ordinary fairness and justice, but, doubtless, with special liberality and consideration, as, from the character of the officials out there, I feel convinced that, our company being almost the first of any magnitude, they will give us every possible encouragement. Knowing, as I do, the officials out there, I feel sure this is the case, but if any confirmation were wanted I may tell you that we have had indications to this effect from, not merely a very high official, but the very highest official of the Selangor Government. (Applause.) As usual, I have kept the best to the end, and that is that it gives me special pleasure to see that this whole meeting is composed of old friends. I do not say this in order to mention something which may be pleasing to you, but because this fact of our knowning each other, and dealing with old friends, makes it still more incumbent on us to do everything in our power, which can possibly be done in furtherance of your interests, so as not to forfeit the full confidence you have hitherto reposed in us, and which I can assure you is highly gratifying to us. I don't mind telling you that some people have expressed the opinion that the anticipations we have as regards this Company have been exaggerated. Of course, this may be so, as in agricultural enterprises the possibility of unforeseen contingencies always exists; but I think I may remind you that when the Sumatra Tobacco Syndicate was formed we were also ridiculed in some quarters for holding out the probability of large dividends, and yet we ultimately paid, as the result of one crop, a dividend of 180 per cent. It has been remarked to me that I personally expressed myself at the time as not satisfied with this dividend. Well, I frankly admit that this was the case, and I am equally frank in telling you now that if our anticipations as regards the Selangor Coffee Syndicate are realised to the letter I shall likewise not be satisfied. I daresay you will, but I expect something still better, and I beg to repeat that our joints efforts will be devoted to bring about a perfect success. As I have mentioned, this is the statutory meeting and there is no resolution to be proposed. It is only a formal meeting, but I think there can be no harm in following the usual custom of inviting any gentleman present to put any question that occurs to him, and, of course, if it is in our power we shall be only to happy to answer it. (Applause.)

No questions being put, the Chairman said: The following telegram from Selangor has just come in: "The property is now in course of transfer, which will probably be completed in a few days." When that transfer takes place we shall be in full swing—in fact, I might say we are in full swing at the present time.

A vote of thanks to the Chairman terminated the meeting.—*H. and C. Mail*, Sept. 13.

PLANTING IN SOUTHERN INDIA.

One of the greatest industries of Southern India is the cultivation of tea and coffee, which thrive on the sunny and rain-swept slopes of the Nilgiris and other hills of the South, and afford continuous and well-paid labour to a large proportion of the inhabitants of the hills and of the plains beneath. A planter's life is often considered by those who have no experience of it to be a dreary and monotonous one. In reality it is anything but that. It is a life full of variety and activity; quite redeemed from any danger of monotony by the element of speculation which enters into it, and which always brings a certain excitement with it. Black care and smiling hope may be said to hover in turns round the path of the planter, which is as full of ups and downs, and as much smiled and frowned upon by fickle Fortune, as is the career of a professional speculator. Coffee-planting, in fact, may almost be described as a fine gamble. A few years ago this industry seemed to be at a low ebb, prices being low and the demand small, but a turn of Fortune's wheel has completely changed the position of affairs. Prices are now high, and all goes swimmingly with the production of the fragrant berry, which has risen enormously in the favour of the public.

In selecting the site for a coffee plantation in these hills there are a variety of things to consider. The land should be sheltered from the wind, and, if possible, lie in the line of the showers that fall in the early part of the year, and yet not be exposed to the full fury of either the S. W. or N. E. monsoons, with their accompanying damp and constant mists and fogs. Land should also be chosen that is never affected by frost, as this scorches and blights the coffee and is as fatal to it as fire. Damp at the roots is another deadly enemy, and all land on which coffee is to grow requires careful drainage. Another great essential is a stream of water which runs during the whole of the crop season: this is a necessity for the process of "pulping" which will be described later. The coffee range varies from 300 to 450 feet or even to 600 feet on the eastern slopes of the Nilgiris. The most favourable site for a plantation is a sheltered valley with a running stream. Coffee is grown from seed, in nurseries, *i.e.*, level plots of ground carefully prepared trenches for water. In about eight months the seedlings are ready for planting, the best time for this being during showery weather, soon after the rains have set in. When the young plants have reached a height of 3½ feet to 4 feet, which takes 3½ to 4 years, time greatly depending on climate, soil, and situation, the trees require topping to prevent their growing any taller. This idea is the outcome of experience, as in Arabia, the original home of coffee, the trees are allowed to grow to a height of from 12 to 20 feet, with a number of stems, nor are the berries plucked as with us, but shaken off, when fully ripe, into mats spread underneath and dried in the sun.

A Nilgiri coffee plantation is a pretty sight, with its lovely ravines, its giant trees which shade the undergrowth of dark green laurel-like shrubs, their branches laden with berries, some green, some gradually changing colour to the bright scarlet of the ripe ones, which closely resemble cherries.

The coffee plant is a very hardy one and will survive and yield after years of neglect and repeated attacks from its many foes. These latter are numerous. Its living enemies are, besides the squirrels, monkeys, rats, and birds, who love the sweet pulpy covering of the ripe berry, the coffee-bug and the "borer," a most destructive insect. The chief diseases to which the coffee shrub is heir are leaf rot —which is caused by damp—and prevails in rainy, misty climates, and its worst foe, the dreaded leaf disease. This latter is the latest and most serious of plagues to which the long-suffering plant is subject, and it is as lasting, damaging, and incurable as the odium in the vine. This is a most serious disease, which appears to have its seat in the sap of the tree, appearing and disappearing with no apparent cause, on all soils, at every elevation. Although it has not yet made its appearance in so dangerous a form on the Nilgiris as in the lower-lying countries of the Wynaad, Coorg, Mysore, or Ceylon, no coffee planter can say that his crops have not been reduced by leaf disease.

Although the day for realizing large fortunes in tea has gone by with a fall in the price of the loaf, that has brought it within the reach of the poorest, tea cultivation yields a steady, if not a big, profit to the planter, who is willing to devote himself to it; personal supervision and even labour being of the utmost importance in tea. The task of the tea-planter is altogether a bigger one than that of the cultivator of coffee. In tea there are at least twenty "pluckings" a year; it therefore requires more continual labour on the estate, as, unlike coffee, tea is prepared ready for consumption. Tea thrives best on the Southern and Eastern slopes of the Nilgiris, which get a fair share of both monsoons, and at the same time possess a warmer and more equable climate than the Western slopes. It requires sufficient moisture, and a certain richness of soil and good drainage; but the less the land on the plantation slopes, the better it is for the tea.

Like coffee, tea is raised from seed in nurseries, and while the seedlings are growing, the estate should be prepared, if necessary, by terracing and by "lining," or marking out and "pitting" cylindrical pits of 18 inches being the best size.

The quality of tea depends on the care bestowed on each of the processes it undergoes; the grade is determined by "sifting." This is performed by women or children, who do it by hand or by machinery, in sieves varying in size, the tea falling through them upon a cloth. The grades in tea are:—1. orange flower, or broken pekoe; 2. pekoe; 3. pekoe souchong; 4. souchong; 5. congou. The dust which results from all these manipulations especially from sifting, is sold by itself, and not mixed with the teas.

Labour has always been a matter of difficulty to the Nilgiri planter. Local labour, alas! is becoming scarcer with every year. It was formerly obtained chiefly from the Badegas, or "Northmen," descendants of Kanarese colonists from the Mysore country. These Badegas are a hard-working and a thrifty race, and thanks to their industrious habits they are becoming a comparatively wealthy people. Their villages are characteristic of their prosperity, and form a striking contrast to those of the other hill tribes, with their rows of neatly thatched or tiled houses, standing in fields of *korali* or *sami* and surrounded by well-stocked farm yards. Prosperity has made them very independent, and they are becoming very unsatisfactory workers, as they keep innumerable holidays, and stay away altogether on the smallest provocation. Having learnt, too, the principles of coffee-planting, and acquired a complete knowledge of its manufacture, they have lately set up as planters themselves in a small way, and quantities of coffee are grown and sold locally by the more wealthy Badegas. There are even instances of Badegas having taken over plantations on the death or retirement of the owner; and, idle and trying as they are as hirelings, they display the greatest energy on their own behalf, and will work night and day for themselves. When any district becomes congested, as Mysore did some five and twenty years ago, there is little difficulty in obtaining labour from it. On the other hand, should a country be blessed by good seasons and consequent prosperity, or, again, should it be visited by a famine, which relieves congestion, the difficulty of obtaining labour is proportionately increased, and it becomes necessary to tap more distant districts. The southern districts of India—Trichinopoly, Madura, and Tinnevelly—are the great recruiting grounds for the planters of Ceylon, the Straits Settlements, and Mauritius. This naturally impoverishes the labour supply of the Nilgiris and other planting districts of Southern India. The labour question is the most important of all the difficulties that arise to harrass the planter, and when he has succeeded in obtaining labour his troubles are by no means at an end. Anyone who has had the slightest acquaintance with Indian life will realize some of the labour difficulties of a European employer, and will understand how constantly friction may arise between the planter and his coolies. At the head of all the labourers on the estate is the writer or overseer, who acts as a go-between between master and men, and supervises all the field labour. But in planting, as in most things, the eye of the master is of supreme importance, and only those planters who are willing to devote their whole time and attention to their estates can hope for a reasonable profit. The lowcountry coolies, who are brought often from a great distance, are housed by the planter on the estate in cooly-lines which every planter is obliged to build for them. Some owners also have a bazaar on the estate for their coolies, which is managed by the writer, and where the labourers and their families can obtain necessaries at the usual rate. Of all the lowcountry coolies those from Mysore are the most respectable. They are also the most careful, saving, and industrious, being of higher caste than the others. The low caste or Pariah coolies, on the contrary, are reckless, extravagant, and generally in want. The low-country coolies work from 7 a.m. till 5 p.m., while the hill coolies, who are not housed, but go to their homes after the day's work, come at 9 a.m. and leave again at 5 p.m. A male coolie employed in ordinary field labour earns 4 as., a woman 2¾ as., and a child from 2 as. and under a day. Skilled labourers employed in the manufacture of tea and coffee are paid at a higher rate, and work overtime is paid for separately. It is a matter of great regret that the Supreme Government seem but little disposed to follow the excellent example set by the Ceylon Government, in enabling planters to contract for the services of coolies for a term of years, but are rather inclined to give as little encouragement and assistance as possible to this industry in the way of legislation, even when the Madras Government, who are in a position to understand local requirements, strongly recommended the adoption of certain measures sought for by the planters of Southern India. Instances of this indifference were given in their opposition to the Breach of Contract Act and the Coffee Stealing Prevention Act, and to other measures of the same character.—*Times of India*, Sept. 21.

EXPORTS OF COTTON SEED OIL FROM THE U. STATES.

During the last fiscal year the exports of cotton seed oil reached 21,161,728 gallons, valued at $6,806,313. This was a gain over the exports of 1894 of 6,203,419 pounds. Of the total exports 3,463,412 gallons went to the United Kingdom; to Germany, 2,674,263 gallons; France, 2,463,994 gallons; rest of Europe, 8,922,716 gallons; Mexico, 1,720,859; Brazil, 593,295 gallons; British North America, 423,067 gallons. It seems incredible that a few years ago cotton seed oil was not known as a commercial product, and that the cotton States wasted material which now brings the country nearly $7,000,000 in a single year. The utilization of waste products is one of the most wonderful chapters in the history of recent times. —*American Grocer*.

THE EXPORT TRADE OF INDIA FOR 1894-5.

INDIA exported "Spices" to the extent of 23 millions of pounds weight in the twelve months ending 31st March last; but "pepper" which used to be by far the most important product under this heading has fallen greatly from its old position; while the trade in "ginger" has developed in quite a wonderful way during the past three years from a total of less than 4¾ million lb. in 1892-3 to more than 10¼ million lb. in 1894-95. The official figures for the three years compare as follows:—

	1892-93	1893-94.	1894-95.
SPICES:—	lb.	lb.	lb.
Cardamoms	304,527	391,019	234,493
Ginger	4,714,203	6,534,529	10,243,707
Pepper	12,257,270	8,651,371	8,135,705
Other sorts	8,825,884	7,711,279	9,395,262
Total lb.	23,101,881	23,289,189	28,009,367

In Cardamoms, it will be observed, there is a considerable decrease on the two previous years—so that all India now exports less than Ceylon which has shipped 260,000 lb. in the nine months of the current year. But then the very large home consumption in India must be remembered. SUGAR, refined or crystallized, including Sugar Candy:—

	1892-93.	1893-94.	1894-95.
	cwt.	cwt.	cwt.
To United Kingdom	667	106,850	15,206
,, Ceylon	23,193	26,317	[illegible]
,, Other Countries	13,593	13,779	11,925
Total cwt.	37,461	146,946	60,179

SUGAR, unrefined, *viz.*, Molasses, and Jaggery or Goor and other Saccharine Produce:—

	cwt.	cwt.	cwt.
To United Kingdom*	698,771	940,122	855 657
,, Egypt	50,531	82,916	75
,, Other Countries	49,471	127,597	102,375
Total cwt.	798,773	1,150,635	958,107

Of the export and distribution of our staple "Tea" there is not much to remark except that the shipment to the United States is showing a continuous increase; but it is unsatisfactory to see the great decline in the quantity to Australia, although on the other hand, Ceylon exports are increasing. What we want is to see China teas altogether ousted and the taste fully established for India and Ceylon tea:—

	1892-93.	1893-94.	1894-95.
TEA:—	lb.	lb.	lb.
To United Kingdom	108,513,141	116,007,328	118,417,084
,, United States	49,957	115,661	227,595
,, Persia	1,406,625	2,497,525	3,172,806
,, Australia	3,908,087	6,239,538	4,871,919
,, Other Countries	844,637	1,472,423	2,409,912
Total lb.	114,722,447	126,332,475	129,099,316

The shipments of Cinchona Bark shew a slight increase, and the decrease in the export of opium is noteworthy:—

CINCHONA BARK lb.	2,813,637	1,665,647	1,737,318
OPIUM cwt.	104,658	97,910	94,645
	lb.	lb.	lb.
TOBACCO:—			
Unmanufactured	11,808,432	8,672,951	9,719,331
Manufactured	823,737	786,785	853,220

Next come a variety of products of more or less interest to us in Ceylon. The falling-off in Cutch ought to be of some concern to the new "Cutch" Company at Trincomalee. Of Myrobalans, Ceylon exports an appreciable quantity and a great deal more could be obtained under careful, extended supervision of our forests:—

DYEING AND TANNING MATERIALS:—	cwt.	cwt.	cwt.
Cutch	229,316	187,115	155,032
Indigo	123,703	131,399	166,308
Myrobalans	667,549	830,529	1,123,113
Safflower	990	2,353	1 790
Turmeric	59,907	68,551	119,422
OILS:—	gallons.	gallons.	gallons
Animal	39,695	50,352	10,325
Essential	18,261	19,055	20,174
Mineral	71,780	67,377	48,391
Paraffine Wax	21,278	28,858	25 458
Vegetable, not Essential—Castor:—			
To United Kingdom	1,173,086	958,759	1,183,265
,, Australia	678,807	545,262	635,050
,, Other Countries	767,099	790,623	860,921
Total gallons	2,578,992	2,294,644	2,679,236

The increase in the export of Coconut Oil is very marked:—

Coconut	Gallons	1,643,971	821,355	2,285,524
Til or Jinjili	,,	122,610	165,084	282,242
Other kinds	,,	359,174	328,763	529,192
Other kinds	cwt.	75,338	44,616	42,810
BORAX	cwt.	7,677	7,230	7,880

The shipments of Indiarubber, year by year, from India, keep wonderfully steady at between 9,000 and 10,000 cwt. collected chiefly in Northern Bengal and Assam forests:—

CAOUTCHOUC, Raw:—	cwt.	cwt.	cwt.
To United Kingdom	7,712	7,721	6,695
,, Other Countries	2,260	1,895	2,575
Total cwt.	9,972	9,616	9,270

* Jaggery to be refined.

BATS!

The *Popular de Taubaté* tells of two planters who gather their coffee with the pulp already removed, this service being performed for them by bats, which eat the pulp as fast as the coffee ripens. This species of bat should be cultivated in Selangor.—*S. F. Press*

THE PINE HILL ESTATES COMPANY, LIMITED.

ANNUAL GENERAL MEETING.

The annual general meeting of this Company was, pursuant to notice, held at Mr. L. P. Fisher's office, Palace Square, Kandy, at 11·30 a.m. on Saturday last, when there were present Messrs. J. Roydon Hughes (in the chair), L. P. Fisher, R. E. Prance H. St. B. Evans, Hunter, and Lieut. Herbert. Miss Nicol was represented by attorney, and Messrs. S. H. Dyer, A. Jemmett Brown, and F. S. Hill, and Mrs. R. E. Prance by proxy.

The notice convening the meeting, and the minutes of the last general meeting, having been read, the report of the Directors for the season ending the 30th of June, 1895, was submitted to the meeting.

Mr. HUGHES proposed, and Mr. FISHER seconded, that the report be adopted. Carried.

Lieut. HERBERT moved that a final dividend of four per cent. be declared, making with the previously declared interim dividend of five per cent., a dividend for the year of nine per cent. Mr. HUNTER seconded. Carried.

Mr. HUNTER moved, and Mr. EVANS seconded, that a further sum of R2,000 be placed to the credit of the reserve fund. Carried.

Mr. R. E. Prance was re-elected Director, and Mr. Guthrie was elected Auditor for the ensuing year.

A vote of thanks to the chair then terminated the proceedings.—Local "Times."

BATS AND COFFEE.—*Apropos* of your para about bats and coffee is the following from Dr. Nicholls' work on *Tropical Agriculture*: "In crop time one will often see parchment coffee on the ground under the trees, this is usually called 'bat coffee' for the bats have eaten the pulp and dropped the beans enveloped in their parchment."—*Cor.*

A TEA MACHINIST'S FACTORY

I spent last week in

ABERDEEN,

where I was glad to meet several Ceylon friends. I also took the opportunity of visiting Mr. William Jackson's factory, where the models of his various inventions are prepared. Mr. Jackson showed me one of his new

PARAGON TEA DRIERS

(similar to the one which has recently been erected on Great Western estate) and explained the various improvements which it possessed over previous driers. I also saw in process of manufacture one of the new tea roll breakers which Mr. Jackson has just invented, a marked feature of which is its comparatively noiseless working. Upstairs were models of Mr. Jackson's various previous inventions; some of the latter ones, however, being absent, owing to their not having yet being returned after production in court at the recent trials of the famous law-suit. On the floor was a quantity of "withered" oaf,—not tea, but

ELDER LEAVES,

a boxful of which, after rolling and firing, stood close at hand. The leaf when hot from the firer has a smell not unlike that of tea, but this soon disappears. When Mr. Jackson first began utilizing the elder leaves thus, he noticed that his workmen, as they left of an evening, would pocket a handful of the fired leaf to carry home. He therefore asked his foreman to make inquiries as to what the men did with it; and he was amused to learn that two cupfuls of the decoction acted as

AN EMETIC!

Mr. Jackson tried one cup of the infusion himself; but it took a lot of cream and sugar to make it palatable. I was also shown a box of

TEA-DUST,

one of five which had been sent to Mr. Jackson from China with an order for a machine that would separate from the tea clay the dust that was mixed with it. (The tea dust, I should explain, was what is used for the manufacture of "brick tea"; and consumers have begun to resent having to pay for and swallow clay dust: hence the application.) The English agent of the Chinese firm was shown a machine which he thought would suit the purpose of his clients; but he would not fix on it until he had referred to them; and meanwhile he insisted on returning the boxes of dust to China. One box, however, Mr. Jackson retained as a curiosity.

TWO INGENIOUS MACHINES OF AMERICAN MANUFACTURE were shown me by Mr. Jackson. One of these was for boring holes in iron or wood, the borer being capable of being moved to any position upwards, downwards, or horizontally. The price was considerably less than that asked for an English machine of inferior capability. To the other machine

AN AMUSING STORY

was attached. One day Mr. Jackson was on the point of leaving for London, when in walked a Yankee, who asked if he would look at a machine for cutting wood, at the same time pulling from his pocket a bundle of prospectuses. Mr. Jackson replied: "I am leaving for London in ten minutes; so you had better show the papers to my foreman." "Oh, but I can show you the machine itself," said the Yankee. "Why, have you got it in your pocket?" asked Mr. Jackson. "No, but it is outside," returned our American friend; "and I can show it to you at work here within ten minutes if you wish." Mr. Jackson consented; and soon up drove a conveyance drawn by a couple of fine horses, with two men holding the machine. This was set up on the floor of Mr. Jackson's workroom; and ten minutes afterwards Mr. Jackson was on his way to the station for London, and the Yankee was away with a cheque in his pocket.

"That is how the Americans do business," added Mr. Jackson, "while the English workmen are napping." The machine, which is a very simple one, has over and over again repaid its cost to Mr. Jackson, who has never repented of his hasty bargain.

D. W. F.

NEW PRODUCTS.

An old planter writes:—"Thanks for the valuable information *re* Camphor; the tree would grow well here, there being several varieties indigenous. Another indigenous tree here might be turned to account the *Gorala* of the Sinhalese belonging to same family as the Mangosteen—and producing the *Gamboge* of commerce—what is the value of Gamboge at present?"

So far back as 1884, a consignment of Gamboge in its natural state from Ceylon fetched £44 5s per cwt. in the home market. This was from the *Garcinia morella* (the "Gokatu" or "Kana Goraka" of the Sinhalese). How collected we cannot say. In 1894, there were 17 cwt.-0-12 lb. of "Gum" exported from Ceylon, the local Customs valuation being R475. In 1893, the export was 41-cwt.-1-6 lb. valued at R1,550. The latest London quotations for Gamboge are:—Siam (pickings to good clean pipe) £6 10s to £10 5s (per cwt. we suppose).

WHOLESOME COFFEE.

A writer in *The Lancet* laments that good, wholesome, pure coffee, free from chicory, is not brought to the notice of the public by advertisers as much as tea, cocoa, or chocolate is. As he observes, those who have travelled on the Continent know that a cup of excellent coffee can be obtained at an almost trifling cost, and know what an excellent stimulant it is. Why (it is asked) should this be? and why, on the other hand, should coffee, even in the homes of the rich in this country, be too often wholly undrinkable? That there is no difficulty about the making of good coffee is held to be proved by the fact that the best is made in the simplest apparatus —a plain earthenware jug. This, with boiling water and a reasonable amount of berries, freshly ground, is all that is required. "Both the demand and supply of coffee in this country (adds the writer) are diminishing, but a more extended knowledge of its value as a stimulant and as an article of diet would ensure its increased use and in due time its reduced price."—*Daily News*, Sept. 5.

THE CANARY ISLANDS.

Although largely and necessarily of a highly technical nature, the lengthy article in the August number of the Journal of the Royal Horticultural Society on "The Plants and Gardens of the Canary Islands," by the Assistant Director of the Royal Gardens at Kew, will be read with considerable interest not only by scientific botanists (who will find, in addition to the general discussion of the flora of the several islands of the Archipelago, a list of such Canary plants as are at present under cultivation at Kew, and a catalogue, apparently the first that has ever been given in English, of the native and introduced plants in the Botanical Garden near Orotava), but by the annually increasing number of our countrymen who direct their steps to these southern resorts to escape the severity and the uncertainties of our winter climate, and also by market-gardeners, fruit growers, and indeed by all classes of tradesmen who are in any way connected with that complicated problem—the distribution of our food supplies, whether obtained from home or foreign sources. The Canary group is composed of 13 islands, six of which are very small. They are situated almost wholly between the parallels of 28deg. and 29deg. N., but they are scattered over several degrees of longitude, so that while Fuerteventura is within 60 miles of Cape Juby on the African coast, Palma and

Hierro are about 300 miles distant. In former times they were known as the Fortunate Islands. Pliny knew of their existence. Juba, King of Mauritania, despatched a fleet to visit them, afterwards reporting them to Augustus Cæsar as clothed with fire. He also sent to Rome two large dogs from the islands, and to this fact is attributed the probable origin of the name Canary. The Portuguese rediscovered the islands in the 14th century, the inhabitants being the brave Guanches. Early in the next century Fuerteventura and Lanzarote were taken possession of by the King of Castile, but it took until nearly the close of the century before the Spaniards succeeded in subjecting the gallant Guanches in all the islands. After cruel persecution at the hands of the conquerors the last of the original inhabitants had disappeared before the end of the 16th century. The islands have ever since been not a colony, but a Spanish province, and their fortune has been a very varied and capricious one. "Under the proscriptive policy of Spain," said one writer, "nothing depending on human exertion prospers, and though the Canary Islands are less exposed to its despotism than any other part of the Spanish Dominions, everything languishes." This, however, is only partially true, for, like our own West Indian Islands, the Canaries have suffered reverses through the changes which from time to time take place in the demands for various products, and the keen competition with which they have to contend. In the early days of the Spanish occupation the cultivation of the sugar-cane was the great industry of the islands, the African negro being the labourer. Vines were introduced long ago, Canary wine or sack being a famous beverage in England in the time of Shakespeare. But mildew, and not Spanish despotism, afterwards wrought sad havoc among the vineyards, and the public taste changed. Cochineal culture was introduced in 1826, and soon became an important industry, but science has discovered how to extract all the colours of the rainbow out of coal tar, and amongst the many sufferers were the Canary Islands, whose cochineal trade dwindled to a mere nothing. They have, however, entered upon another prosperous period, thanks to the indefatigable exertions of Mr. Alfred Jones, of Liverpool, who has induced the inhabitants to try other industries.

So far as invalids and holiday-makers are concerned the geographical situation of the Archipelago is all that could be desired. They are not in the Tropics, and they can hardly be described as being of the Temperate zone. But while the islands are all in about the same latitude, they present differences in aspect, climate, crops, flora, customs of the people, and so on the eastern islands being more African and the western ones more Atlantic in character, and, as Dr. Morris points out, the amount of vegetation in the several islands increases with their distance from the African mainland. At Las Palmas, in Grand Canary, the coldest month is January, but the mean temperature for this month exceeds 62deg., against less than 50deg. on the Riviera, and about 39deg., in London. July is the warmest month at the Royal Observatory, Greenwich, its mean temperature being 62½deg., so that mid-winter in Grand Canary is as warm as midsummer in London, the lowest night temperature registered at Las Palmas in five years being 51½deg. Passenger steamers frequently call at the islands, the voyage from Plymouth occupying five days, from London six, and from Liverpool seven. The islands are almost entirely of volcanic formation—really the peaks of submerged mountains a continuation of the Atlas chain running westward from Morocco into the Atlantic. Since the close of last century there have been no volcanic outbreaks, but formerly they were rather severe, the eruption of 1704 destroying thousands of lives and a number of towns on the island of Teneriffe. To get at the volcanic mud, which is a rich fruitful soil, it is often necessary to blast the solid overlying lava, and this has to be piled up in heaps so that the country presents locally the appearance of an extensive stone quarry. Both soil and climate are favourable to widely dissimilar classes of vegetation, strictly tropical plants such as the sugar cane, banana, the oil palm of Africa, and the coconut palm growing alongside the common oak, ash, bramble, white poplar, and other trees of our more northern latitude. The most remarkable tree in the Canaries seems to be the dragon's-blood tree, one "of the most celebrated in the annals of natural history." Strange to say, similar dragon's-blood trees are known to grow in various parts of Africa, across to Abyssinia, Somaliland, and still further east on the island of Socotra. Professor Bayley Balfour states that they are remains of an old African flora which covered the greater part of the continent when the climatic was very much colder than it is now. Climatic changes had gradually driven it out and replaced it by more tropical plants.

The islands now depend for their living mainly on garden cultivation, there being no large estates or farms. All the fields are small, land being exceedingly valuable everywhere. Its letting value is from £15 to £25 per acre, and to this has to be added the cost of water, which runs to from £10 to £15 an acre. An acre of good land therefore means an initial expenditure of £40 and the cost of labour before any profit can be made. An excellent system of irrigation is, however, in operation, large tanks having been constructed to store up the winter rains for use during the dry season. The secret of the present prosperity of the Canaries is this provision to secure an abundance of moisture all the year round. Without it the land would be of very little value. As it is, the tenants are able to raise three, and even four crops a year—a fact which has been received with some incredulity by not a few English agriculturists. This prolific quality of the soil explains why the rents are so high, but with so many harvests it is not unusual for the thrifty and hard-working inhabitants to clear £30 an acre per annum—a very good profit on the large outlay. The whole of the work is done in the most primitive fashion, wooden ploughs drawn by oxen doing all the ploughing necessary. With what rapidity crops reach maturity may be gathered from the fact that a steamer leaving England with seed potatoes in the middle of November returns home with a cargo of new potatoes in the following February, the plants appearing above ground in about a week, and in another five or six weeks the tubers are dug up and shipped. England is the principal customer for the fruit and vegetables grown in the Canaries. In 1892 we received 59,508 tons out of the 63,601 tons of bananas exported from the islands; and of the 96,842 tons of vegetables 59,124 tons came to England, and 27,973 tons went to the West Indies. Most of the bananas come to us from Grand Canary and most of the tomatoes and potatoes from Teneriffe. We received in one year no less than 118,632 tons of fresh fruit from these fortunate

isles. Bananas are largely grown on Grand Canary and Teneriffe, flourishing only on well-irrigated land in warm localities near the sea. Each bunch is made up of from 150 to 250 fingers, and in 1893 Grand Canary alone exported 217,095 bunches. Canary oranges are of excellent flavour, and recall the now almost extinct St. Michael oranges. The trees unfortunately are little cared for, and they are consequently badly affected with disease. The tomato industry is quite a new one, but it has increased by leaps and bounds. Not until 1887 were any tomatoes exported, by 1893 there were 54,641 cases, and in the first half of 1894 the total was 85,000 cases. The actual cost of growing, packing, and delivering in London is estimated at 2d per lb. The potato trade is confined to the early months of the year, down to the end of May. In the first half of 1893 the number of cases shipped was 15,101, and for the corresponding period of 1894 it rose to 32,600. There is still some trade in wine cochineal, cereals, sugar, and many other fruits and vegetables, but it is evident that the inhabitants are concentrating their energies mainly on bananas, potatoes, and tomatoes, for the English markets in the first place.—*Morning Post.*

A FICUS STRANGLING A MANGO TREE.

Our illustration, taken from a photograph kindly furnished by Mr. G. M. Woodson, College of Science, Poonah, exhibits a Mango tree growing in a grove near Lanowlee, on the Western Ghauts, India, being killed in the embraces of a Ficus. The process of destruction is well and correctly described in the following words by Mr. James Rodway in the *Guiana Forest* :—

"Woe betide the forest giant when he falls into the clutches of the Clusia or Fig. Its seeds being provided with a pulp, which is very pleasant to the taste of a great number of birds, are carried from tree to tree, and deposited on the branches. Here it germinates, the leafy stem rising upward, and the roots flowing, as it were, down the trunk until they reach the soil. At first these aërial roots are soft and delicate, with apparently no more power for evil than so many small streams of pitch, which they resemble in their slowly-flowing motion downward. Here and there they branch, especially if an obstruction is met with, when the stream either changes its course or divides to right and left. Meanwhile leafy branches have been developed, which push themselves through the canopy above, and get into the light, where their growth is enormously accelerated. As this takes place the roots have generally reached the ground, and begun to draw sustenance from below to strengthen the whole plant. Then comes a wonderful development. The hitherto soft aërial roots begin to harden and spread wider and wider, throwing out side-branches which flow into and amalgamate with each other until the whole tree-trunk is bound in a series of irregular living hoops. The strangler is now ready for its deadly work. The forest giant, like all exogens, must have room to increase in girth, and here he is bound by cords which are stronger than iron bands. Like an athlete, he tries to expand and burst his fetters, and if they were rigid he might succeed. . . . The bark bulge between every interlacing—bulges out, and even tries to overlap; but the monster has taken every precaution against this by making its bands very numerous and wide. . . . . As the tree becomes weaker its leaves begin to fall, and this gives more room for its foe. Soon the strangler expands itself into a great bush almost as large as the mass of branches and foliage it has effaced. . . . . If we look carefully around us we see examples of entire obliteration—a Clusia, or Fig, standing on its reticulated hollow pillar, with only a heap of brown humus at its base to show what has become of the trunk which once stood up in all its majesty on that spot."—*Gardeners' Chronicle*, Sept. 21.

A FIRE RESISTING TREE.

An interesting account of a fire resisting tree is given by Mr. Robert Thomson in a Consular report on Colombia. He writes :—The thousands of square miles of natural pasturage on the plains and lower hills of Tolima assume during the rainy season the most beautiful verdure. But in the alternate season of drought the general aspect is that of a desert. These lands were originally acquired at a nominal cost. No conservation of the natural fertility of the land has ever been taken into consideration. On the contrary, the natural grasses, intermixed with scrub or brushwood, have been systematically burned from year to year, and the burnings effected during the most scorching periods of drought. The principal object attained by this process of despoliation is the reproduction of new and tender herbage or pasturage, which, with the advent of the rainy season, forthwith covers the parched surface. Vast pastoral regions—scores of thousands of square miles—in tropical America are thus maintained. Half a century, or it may be a century, of this treatment suffices to extinguish almost every trace of fertility in the soil. In Tolima alone hardly less than 2,000 square miles of sâvannahs and hills, ascending to some 3,000 feet, have in this way been transformed into comparatively barren wastes. And in other parts of the Republic many thousands of square miles have similarly lapsed by this devastating process.

A STRANGE SIGHT.

This persistent burning of the savannahs and hills for crops of renewed pasturage plays desperate havoc with all other vegetation, trees and brushwood. Isolated palm trees, with their intensely hard trunks and endogenous structure, together with groups of brushwood in sheltered or humid spots, sometimes withstand the fury of the flames. There is, however, one phenomenal exception to this subversive power of the fires. A humble tree with contorted and rugged trunks and branches and scabrous leaves, a tree presenting the most subdued and weird aspect conceivable ; this pigmy tree not only resists the fury of the flames, but fire is actually congenial and subservient to its existence, for the tree, instigated by the conflagrations, forms itself into great plantations. The name of this tree is chaparro (Rhopala obovata), indigenous to Colombia and other South American countries. It attains a height of 15 to 20 feet, and its distorted trunks measure from nine to 12 inches in diameter. It is widely distributed in Colombia, for I have found it at the Sierra Nevada, of Santa Marta and dispersed inland 1,000 miles from the sea. In contact with great forest fires it maintains a precarious existence. But, as already explained, it usurps dominion in places where no other tree can grow. In Tolima it abounds on the slopes and ridges of the hills at elevations from 1,000 to 3,500 feet. In this department alone hundreds of square miles of the lower hills which have been reduced to sterility by incessant burnings are occupied by this diminutive tree, and it assumes the aspect of vast systematically formed and well-kept plantations. This is more than a triumph of the "survival of the fittest." It is very remarkable that these fire-begotten plantations are nowhere crowded to excess ; on the contrary the trees are so regularly placed that their aspect vies with that of the most carefully formed plantations. There is a popular belief in Tolima where alluvial gold abounds that this tree flourishes only on those seductive lands, serving as a guide to searchers after the precious metal.—*Pioneer.*

GOVERNMENT CINCHONA PLANTATION IN BENGAL.

The result of the year's operations of the Government Cinchona Plantation and factory in Bengal was that the total number of living cinchona plants at the Government plantations in Sikkim and at Nimbong, excluding the nursery stock at the close of the year, was 3,927,501. The demand for quinine having increased owing to the success of the pice-packet system, Dr King has ordered two to three hundred acres of land to be prepared for the purpose of being planted out with new trees. The crop of the year amounted to 500,534 lb. of dry bark, of which 295,054 lb. were obtained from the trees uprooted on the Government plantation in Sikkim, and 205,480 lb. were collected from the trees uprooted at Nimbong. The bulk of the bark, with the exception of 126,603 lb. of the red sort, was of the quinine-producing kind. The outturn of bark per tree was over a pound, as compared with less than half a pound per tree in the preceding year, when the majority of the trees cropped were dwarfed and feeble. The whole crop, less 1,959 lb. sold to a medical depôt and to other purchasers, was, as usual, made over to the Cinchona Factory for disposal. The outturn of the factory was 8,318 lb. of sulphate of quinine, the produce of 393,150 lb. of yellow bark, and 4,032 lb. of cinchona febrifuge, the yield from 105,560 lb. of red bark. All these figures are decidedly satisfactory, but a precisely similar question arises in regard to the Bengal plantation and factory to that raised with reference to the Madras concern: Is it impossible for private plantations to supply Government with all the bark it requires in excess of the production of the Government plantations as they now stand? If it is, the extension of the plantations is justifiable. If, however, private enterprise is able and willing to meet the demand, than an extension of the Government plantations can only be regarded as a step in the direction of State interference with private trade. Such interference is opposed to the principles laid down by the British Government and the Government of India, and we trust that planters, and others, in Bengal will stand by planters down here in their representation to the effect that no extension of Government cinchona plantations in this country is necessary or desirable. The manufacture of quinine is quite a distinct matter from the production of cinchona-bark. Private enterprise has so far manifested no inclination to take the former in hand, so the Government is free to develop the manufacture as much as it likes.—*Madras Times.*

COFFEE PLANTING IN THE HAWAIIAN ISLANDS:

250,000 ACRES OF SUITABLE LAND AVAILABLE:

2,500 ACRES PLANTED: 20,000 MORE EXPECTED IN 2 OR 3 YEARS.

A REPORT has lately been made to the Executive and Advisory Council of the Republic of Hawaii by a Labour Commission relative to the Coffee Planting industry. Having in view the disasters which have happened in certain British Colonies owing to shortage of labour the authorities in Hawaii are looking ahead and are considering what steps should be taken to render impossible in their case the evils referred to. The framers of the Report are fully aware of the danger which exists in allowing the island to depend entirely upon the single industry of sugar. In reviewing the present condition of the coffee industry the report states:—

The soil and climate of several districts are admirably adapted to the cultivation of coffee, and there is no reason why this industry should not in a few years, with proper encouragement, equal in the value of its product the sugar industry. In the Kona district of Hawaii, the land suitable for coffee planting covers an area of more than 80,000 acres. The excellent growth of the coffee plants and the quality of their fruit during the last forty years, demonstrate the exceptional adaptability of this district for the purpose. Aside from wild or uncultivated plants which cover considerable areas, there are probably 100 acres which have been recently planted and will soon be in bearing. This acreage is being added to every month, while buildings are being erected, and other improvements made. Several plantations have recently been started with considerable capital, men of experience and means are engaging in the business, and the majority of the planters reside on their plantations and superintend their own work. In this district the successful production of coffee has been thoroughly demonstrated. The greatest drawback, however, to its more extended cultivation here is the inability of settlers to acquire lands, owing to the fact that vast areas are covered by leasehold interests, which bring little revenue to their owners or the Government. If arrangements could be made by legal enactment or otherwise, by which these large areas could be generally opened up to settlers, there would be in a few years an extraordinary growth of the coffee industry in this district. In the Puna and Hilo districts there has also been within two years a great development of this industry. In the Olaa section nearly 14,000 acres have been leased to proprietors who are now engaged in it. About 600 acres have been planted, while nearly 1,000 acres have been cleared at great expense, and are nearly ready for planting. In the Puna, Hilo and Hamakua districts of the island of Hawaii, there are probably 150,000 acres of land on which the coffee plant will grow to more or less advantage, and upon this land, also, fruits and vegetables may be successfully cultivated. None of the land herein referred to as suitable for coffee, is now planted with sugarcane, and most of it is unsuitable for sugar cultivation.

On the island of Maui there are a number of excellent coffee plantations. In Hamakualoa, about sixty Portuguese families have secured homesteads, and each of them has a coffee patch. The largest planter on the island is a Chinaman in the Kula district. Without attempting to give even approximate figures, it is safe to say that many thousands of acres of land on that island are suitable for this purpose. There is also a considerable acreage under cultivation on the islands of Oahu and Kauai.

The opinion is expressed in the Report that coffee planting encourages a desirable class of settlers and in this connection it is mentioned:—

It is a significant fact that there are already over 200 intelligent, enterprising white men, mostly small proprietors, engaged in this industry, nearly all of whom will become permanent settlers.

Regarding the extent of land in coffee plantations stated at 2,500 acres:—

In November, 1892, a committee of the Planters' Labor & Supply Company estimated that the acreage of the cultivated coffee land on Hawaii, Maui and Molokai was 1,325. If to this is added that of Oahu and Kauai, and also the large increase during the last two years, it is safe to estimate that the total acreage is now not far from 2,500. If there should be as now proposed by the Government, a wise and satisfactory adjustment of the land tenures, there may be within a few years not less than 20,000 acres under coffee. Moreover, it is very apparent that the sugar planters are closly watching the pioneers in coffee, and if they are successful, many of the former will place large areas of land now uncultivated, under coffee, and make this industry auxiliary to that of sugar.

For facts and figures the Commissioners refer to the case of Ceylon and the report states:—

In 1875 the official returns of the Island of Ceylon showed that 204,000 acres of land were under coffee, and that 200,000 laborers were required in the cultivation; that is to say, about one laborer to the acre. With the better class of labor and improved methods in these Islands, it is believed that one man can cultivate three, or in some cases, even five acres. But in the picking season there will pro-

bably be neeeed about one person to the acre. Women and children would supply this need to some extent, if men with families could be induced to immigrate and settle here. If there should be within the next few years 20,000 acres of land under coffee cultivation on Hawaii alone, there would be needed in the picking season, according to the above estimate, nearly 20,000 laborers including women and children. According to returns received at the office of this Commission, the number of laborers employed on all the sugar plantations on December 31st, 1894, was between 20,000 and 21,000. Such an increase in the coffee acreage would therefore require, during part of each year, as many laborers as are now employed in the great sugar industry of the country. The demand for laborers on the coffee plantations is now readily supplied by the Japanese whose contracts with the sugar planters have expired. The demand for this labor is as yet limited, but it is evident that with the present rate of increase in acreage there must inevitably develop a competition for laborers between the sugar and coffee planters which may prove disastrous to both, or may result in the irreparable losses before referred to as experienced in Demarara and the Strait Settlements. There is no doubt that in those countries the labor question was allowed "to take care of itself," and with the most disastrous results. A similar experience here, caused by a want of laborers, might be regarded as a national disaster in more ways than one. The subject, therefore, becomes one of supreme importance to the State and community.

The Commissioners proceed to put a valuation on the coffee plantations in the following manner:—

Regarding the coffee industry as a source of Government revenue, the Commission is informed that in the island of Ceylon, the coffee plants have, when in full bearing, for some purposes, the value of one dollar a tree. It seems to the Commission that the same valuation may be justly placed on the plants here, if the planters meet with anything like the success they expect. For purposes of sale coffee land with full bearing trees upon it, would be worth $500 per acre, allowing only 500 trees to the acre and calling the land nothing. On this basis the value of 20,000 acres with coffee trees in bearing would be $10,000,000, and at the present tax rate of one per cent., if taxed at that value, the annual revenue to the Government would be $100,000. This estimate is, however, only suggestive, it being most likely that the coffee plantations would be valued for purposes of taxation, at considerably lower figures. The annual product of the crop from the moderate area named, allowing 800 trees to the acre, which is less than the average, would be, at one pound to the tree, 16,000,000 pounds, which, at the price of fifteen cents per pound, would amount to $2,400,000, or about one-third the value of the present sugar crop. This gross return of $2,400,000 would give, if equally divided, $1,000 each to 2,400 families, or $500 each to 4,800 families. Estimating four persons to the family, it appears that nearly 20,000 persons could derive a comfortable living from this moderate acreage, and with more comfort than the average moderate farmer in the United States is able to get. The value of other home products is not here taken into account. Small independent proprietors would produce for their own consumption, and by their own labor, vegetables, fruits, poultry, and meats, the value of which should be added to the income from the coffee crop. The value of these products, even if not sold, is of great importance in the economy of life. This estimate, if correct, shows again the importance and value of this industry in reconstructing the social and political situation in the Islands. If twenty thousand acres of land should be successfully placed under coffee cultivation within the next two or three years, there is no reason why 30,000 or 50,000 acres more should not be put under cultivation at no distant period. No article known in the world's trade as a staple article, saleable in all markets, has been up to the present time produced in these Islands, besides sugar and rice. The production of coffee now adds another staple article.

The Report goes on to deal with the labour question in detail. It is a question of whether occidental or oriental countries are to be tapped for labour supply. Sentiment, it is stated, is against eastern labour, a fact which by no means simplifies the position.

INDIAN GOVERNMENT BOTANICAL GARDENS NEAR MUSSOOREE.

We have received a copy of the report of the progress of the Government Botanical Gardens at Saharanpur, Mussooree. The financial results are satisfactory and considerable work has been done in the way of improvement. The Garden still continues to supply the Medical Department with drugs, but the demand during the year was less than usual. The Ceylon medical stores are at present doing something in the way of preparing ointments, tinctures, &c., by which a considerable saving is no doubt being effected, and the idea of "growing" some of their own drugs might with advantage be borrowed from North-West India. We note that there is a good sale of fruit from the Gardens, as much as R1,306 having been realized during the past year. The American Dewberry is again reported to give excellent results, but we have not yet heard of the plants at the Hakgala Gardens or those with Mr. J. W. Ebert at Demetegoda, as bearing fruit. Mention is made of the introduction of the "Red Ceylon Peach" into the Gardens from Florida, which however, turns out to be no stranger to Saharanpur. The report mentions the despatch of cow pea seed to the Superintendent of the Colombo School of Agriculture, who has already reported in his "Agricultural Magazine"—see file of *Tropical Agriculturist*—of the success of his trials. Sisal Hemp is stated to be making excellent progress, growing on raised embankments. Regarding Teosinte, another fodder plant successfully introduced into Colombo by the Superintendent of the School of Agriculture, and grown at the School and a few other places, we are told "the plant yields a nutritious and excellent green forage, so it cannot be made too widely known, or be too often brought to the notice of all who require to grow forage in large quantities."

OFFICIAL IGNORANCE ON PLAN G MATTERS:

A CLEVER AND ORIGINAL SPEECH.

The following speech, which was delivered by Mr. J. W. Hocking, of Wynaad, in moving the adoption of the address to the Viceroy at the last general meeting of the U. P. A. S. I., but which was inadvertently omitted by our reporter, deserves publication as it exemplifies clearly the ignorance prevailing on planting matters:—

A great deal had been said about the necessity of educating Government to a knowledge of their position. He could give an excellent instance of how one person had been educated to a knowledge of the planter's position. His wife was brought up on "Uncle Tom's cabin" idea that all planters were slave drivers. She had lived in the midst of a large labouring population and, through continually hearing their grievances, she became an ardent Radical in regard to improving the position of the labouring classes. But she met with the same difficulty planters are met with. Planters are recommended by Government to solve all their difficulties by raising the rate of pay. Talking over this subject with a Radical friend of hérs, 'the village mason, the same difficulty met Mrs. Hockin. It is quite true, she said, that you ought to have more wages, but if they were raised higher than they are now who in this parish could afford to employ you? The man scratched his head and said That is so, I never thought of that. Apparently the Government of India also had never thought of that. Planters had to make two ends meet; they paid their coolies as much as they could afford which was a very large increase on

what the coolies could earn in their own villages. Although his wife had repeatedly declared she would never marry a planter, she eventually did so, and had now over ten years' experience of planters and instead of classing them with the villain Segrce or even with the well-meaning St. Clair who found himself helpless in the face of the evil system then obtaining in America, she now classes planters with the benevolent squire and farmer in England without whom every one, except the most bigoted Radical, admits the country parish could not get on. No man is a hero to his own valet and few are so to a wife with Radical ideas, but if practical experience can convert a Radical wife to think well of planters' treatment of their coolies, planters need not despair that a similar experience may have a similar effect on the Government of India and the Secretary of State. It is for that reason that planters ask that an enquiry may be made into the working of Act XIII of 1859 in Southern India. Planters have every confidence that the Collectors of Southern India will report as the Commissioner of the Tea Districts in Northern India did that the practical working of the Act is "harmless and even beneficial." Planters have been repeatedly taunted by English lawyers that the measures they demand are opposed to the principles of modern legislation. In reply they would point to the English Merchant Shipping Act passed in 1854 and amended so lately as 1880. In that Act penal punishment is provided for the breach of a civil contract, doubtless because the merchant sailor being generally, not only penniless, but under an advance from the ship before she sails, no fine can be levied. Planters claim that their case is on all fours with that of the merchant captain; their coolies are not only penniless but, like the sailor, always in debt to some one and advances are absolutely necessary to provide for the coolies families in their absence and to free them from the debt they always owe to the village landlord and trader who will not allow them to move until the debts are paid. No fine can be levied on coolies with no property but debt as it cannot be levied on a sailor in a similar case, and if the imprisonment of the English sailor for breach of civil contract is not opposed to the principles of modern legislation it is difficult to understand why the imprisonment of the coolies, for the same offence and under similar condition is.—*M. Mail.*

TEA PLANTING IN CEYLON.

Rum-tom-tom, rum tom-tom, rum-tom-tom. These were the sounds that woke me up from my sleep the first morning after my arrival on the tea estate to which I had come out to learn my work as a tea planter under the premium pupil system. While I was wondering what all the noise was about, a servant knocked at my door and told me that the tom-tom was beating to summon the coolies to work, and that unless I wanted to be late I must dress quickly. It was then something after 5-30 a.m., and was just getting light. There is hardly any dawn or twilight in Ceylon. The variation of time, during the twelve months, of the sun's rising and setting is only a matter of about twenty minutes, and so practically all the year round daylight lasts from 6 a.m. to 6 p.m.

In less than no time I was dressed, for I was young and curious, and, after swallowing down a cup of tea along with some toast and a banana, away I rushed to the muster ground, to find the coolies all drawn up two deep in the form of three sides of a square, the men on one side, the women on another, and the children on the third. The "conductor," *i.e.*, native overseer, and the "kanganies" stood in the centre, the latter vigorously chewing away at what I afterwards found to be betel leaf and tobacco. The betel leaf mixture is the regulation chew, and is as necessary to the natives as smoking is to us. The women and even the children use it. A small piece of arecanut, a betel leaf smeared with lime, a bit of dried tobacco, *et voila tout!* It is wonderful how national and individual tastes differ. I have often tried a chew, with the only result of feeling distinctly unwell afterwards. Well, the coolies were then all sent to their respective occupations, each gang attended by one or more kanganies, the women and children to pluck the tea leaves, and the men to various other things, such as cleaning out drains, mending roads, *et hoc genus omne* of work.

I remember the first mystery I was initiated into was the plucking of tea leaves. The plucking coolies are all armed with cane baskets about 2ft. to 3ft. deep and from 1ft. to 1½ft. wide. These they tie round their waists or sling over their heads. Then each coolie is given a row of tea bushes, for the tea bush are always planted in rows about 3½ feet distant and 3½ feet from each other. When a coolie has finished her row she takes the first after the last row being plucked, and so they go on. Tea bushes are ready to be plucked every eight days or so, for by that time the new shoots have grown big enough, and if allowed to remain longer, the leaf runs away and gets too coarse. At different times of the year the shoots grow quicker or slower. The art in plucking is this. The new shoot starts with a small leaf called the fish leaf. Now, one leaf, or at all events, half a leaf, should be left above the fish leaf, and the stalk above nipped off and put into the basket, and the shoot should only have grown enough to have the spike and two leaves on the plucked stalk, thus. Of course, one cannot always get round the estate quick enough to get the leaf plucked off in this condition; during some parts of the year rushes will come on, and the leaf will run away. The result of which is a great deal of coarse leaf in the tea, which detracts much from the delicate flavour of the spike and first two leaves.

I did feel very foolish that first morning among the coolies, to hear them all jabbering round one like so many monkeys let loose out of the Zoo.; to feel instinctively that I was the subject of their conversation, and yet not to understand a single word; to wander about and try to look as if I knew all about it, when I felt most distinctly that I knew absolutely nothing. To try to climb the steep side of the hill, holding on to the tea bushes for dear life, with the only result of tumbling back myself, or sending a shower of earth and stones on to the coolies beneath me amidst the suppressed titters of all excep the one who received the shower. I guess she thought the more. Oh! it was most embarrassing. I thought the morning was never going to come to an end, but at last I was informed that it was time to weigh the leaf.

Weighing the leaf is quite a business. Every coolie brings up his or her basket of leaf, which is weighed with a pocket balance. The number of lbs. plucked is marked in a check-book, and the leaf is emptied into big baskets, which are carried down to the factory by coolies. One big basket of leaf weighs about 60 lb., and this weight a man coolie will carry on his head with the greatest ease. On many estates now they run the leaf in sacks from the tops of the hills down to the factory by one or more wire shoots. This method saves a great deal of labour.

As soon as the weighing was over, I toiled back to the bungalow to enjoy the luxury of a bath. And a luxury it was, too. We then had breakfast, or what they call breakfast, for to me it seemed like an early dinner. Mulligatawny soup, a couple of *entrées*, cold beef, curried fowl, bread and cheese, the whole washed down by excellent draught beer. 1-30 p.m. saw me out again, and, after losing myself two or three times on the estate roads, I at last managed to find the plucking coolies, who had just had their leaf weighed for the second time. Then till four o'clock followed almost a repetition of the morning, only I was beginning to feel quite proud of myself by this time, for I could say "Ingevā" (come hear), "Ango po" (go there), and a few other like phrases. At four o'clock the horn blew at the factory, and away we went down there for afternoon muster. The leaf was then weighed for the third time, and every coolie who had plucked a certain amount of green leaf during the day got "full name," and those that had plucked under that amount "half name." Of course, the number of pounds varies according to the

amount of "flush" on the bushes, and the first thing one should do on going into the field where the pluckers are is to tell by looking at the "flush" how much each coolie must pluck in order to get "full name." A good coolie will pluck from 20 lb to 30 lb with a fair flush. Very often a cent cash is given for every pound over 20 lb and I have known a woman to pluck 60 lb and more in one day with a good flush on. By the time the leaf has been weighed, all the other coolies from other parts of the estate had assembled, and a mark put against their names in the check roll if they had done a full day's work, and half if they had not finished their task. By 4-30 muster was over, and so finished my first day's work on a tea estate. Quite an easy one, as I afterwards found out; for during most months of the year there are various works going on which have to be supervised very carefully—clearing, planting, pruning, &c. The weeding of the estate is always given out in contracts to the kanganies at so much per acre, and one has to see that these contracts are kept clear up to date.

The most important, and probably most scientific work on an estate is in the factory in the manufacture of tea. The process of turning the leaf from its green state when plucked off the tree into the condition in which we see it at home is one of great interest; and in large factories hundreds of pounds worth of machinery are worked by turbines or steam engines. The process is, when the leaf is brought into the factory it is spread out very thinly on tats of jute hessian cloth, stretched tightly 6 in. or so one above each other; there it is left for several hours to wither, on an average from sixteen to twenty-four. Of course the weather greatly affects the time of withering. When the leaf is sufficiently withered, it should feel, when squeezed up in the hand, something like a silk handkerchief. Then it is taken and put into a roller and rolled till all the capsules in the leaf are thoroughly broken, but the leaf itself, though rolled and pulpy, should not be chopped up. Nearly every planter has his own ideas as to the proper method of rolling, and certainly no hard and fast rule can be laid down. The planter must study the texture of his leaf, &c., and judge for himself what suits his estate best.

After rolling is over, the leaf is laid out on tables and allowed to ferment for a short time, then it is put through the firing machine, and it comes out at the other end tea, as the term is applied at home. But the process is not yet over. There are machines called sifters, and through them the bulk is sifted on wire meshes, of different sizes, the top mesh coarse, the next finer, the next finer still, and so on; and by this we get the different grades of Broken Pekoe, Pekoe, Pekoe Souchongs, &c. The tea is kept in big bins, and once a week or fortnight or month, as is necessary, the tea is packed in chests on which are stamped the grade, the name of the estate, and any other necessary information. The coolies carry it off to the storehouse on the Government road, from whence it is carried by bullock carts to the nearest station, often, as in the case of the district I was in, over sixty miles away.

The trains take the chests to the Agents in Colombo, who ship them off to the tea auctions in Mincing-lane. Only very intelligent coolies are employed in the factory, and, as a rule, they receive higher wages than the others. An ordinary coolie's pay averages from 8d to 9d per diem. The estate supplies him with rice, which is deducted from his pay, but rows of quarters called "lines" are supplied free. A coolie takes a ½ bushel of rice a week, but he is not allowed his full quantity unless he turns up for muster five days in the week, except in cases of illness. My experience of coolies is that they are very good fellows to work, provided they are justly and firmly treated. The cost of production of tea must necessarily be very cheap in order to make any profit. In fact it should be placed in the London market for something about 6d. per lb.

A tea planter's life in Ceylon is by no means an unpleasant one; indeed, I look back upon the time spent there as some of the happiest years of my life but the work is often hard and very monotonous, and, to those who cannot stand tropical heat, most trying. The usual way of learning one's work is under the pupil system. You pay a planter from £150 to £200 for a year, for which he boards you, and lets you learn the work on his place, and also promises to do his best to get you a billet of "sina durai," *i.e.*, under assistant, at the expiration of your year. A sina-durai's billet usually begins with 83·33Rs. per mensem, that means a nominal £100 per month; but, of course, with exchange so low, it is not actually half that sum in sterling money. When I left Ceylon nearly two years ago the island was simply swarming with young fellows, and it was difficult to get these billets, and I knew lots of young men who were only too glad to work for their board. I think it is most imprudent for any young fellow to go out to Ceylon to become a tea planter unless he has got a fairly good capital to back him. I have seen very moderate estates indeed sold for £8,000. Of course, it is cheaper to open up land yourself, but then you must wait for three years before you can expect any returns.

For anyone fond of sport there is generally plenty to be obtained in the way of deer, pigeons, &c., and in the wet months snipe. Down in the "low country" there is some big game, but nowadays elephants are getting so scarce that one has to pay a license of R100 for every one shot. I never met such thorough good fellows anywhere as the planters in Ceylon, most hospitable and generous, and I received more real kindness during my four years' residence there from people almost comparative strangers than I think I should have at home. No wonder that I entertain the happiest recollections of the years I spent in "sunny Ceylon."

VOYAGEUR.

—*The Field.*]

CAUCASIAN TEA.

The successful experiments made with the tea cultivation in the Caucasus have led to very sanguine expectations as to the future. M. Bataline, the director of the St. Petersburg Botanic Gardens, has visited the Caucasian shore of the Black Sea for the purpose of reporting on its cultivation. In this report he says that the resources of the country are admirable, but little has been done to use them. "Over an extent of thirty versts, from Novorossiisk to Gheledjik," says the report, "the soil and the climate are not favourable to the cultivation of fruit. The only important orchards are those in the neighbourhood of Touapse. The strip of land between Gheledjik and the Asche River is, on the other hand, highly suited to this kind of cultivation. Here are found wild the chestnut, the laurel, the samschit or Caucasian palm, and, to the South of Gaza, even the olive. At Soukhoum plants can be cultivated which were formerly not dreamed of. Fruits and grapes are not good, but rice, indigo, cotton, olives, palms, lemons, and oranges have been acclimatised, especially on the property of M. P. Tatarinow. A tree nine years old produces, on this estate, about 400 oranges a year. The tea plant also grows here. The English were the first to demonstrate that the soil of this locality exactly resembles that of those parts of China where the best kinds of tea are grown. The first person who succeeded in growing the tea plant in the Caucasus was Colonel Solovtsow, who, however, had many difficulties to contend against. At first he had to import plants from China since none can be bought in Europe; the Customs formalities greatly hampered him. The Customs House officers went so far as to disinfect these plants, believing them to be vines, and hoping to prevent the phylloxera. The Societe Economique Libre sent M. Soolvtsow a telegram congratulating him on his excellent results.

"At the meeting at which M. Bataline read his report, tea grown in the Caucasus was served and its flavor was found to be satisfactory. The tea plantations of Colonel Solovtsow are situated in the arrondissement of Batoum. He began to cultivate tea nine years ago and he has had excellent results,

The first attempts to grow the tea plant in the Caucasus were made thirty years ago, but they were not successful. Professor Boutlerow intended to renew them at Soukhoum, but the project was interrupted by his death and his successors had no success. Now the cultivation of the tea plant seems to be safely introduced into the province and it is under the protection of the Government." In conclusion M. Bataline says: "The events which are now proceeding in the Far East may bring about notable changes in the tea trade. The English have long been growing tea on the slopes of the Himalayas and in Ceylon, but the Colombo tea is disagreeable in flavour. Our Caucasian tea is superior in quality and we may, perhaps, look forward in a few years to drinking Russian instead of Chinese, which now costs us annually 42,000,000 roubles, just as the Russian wines are every day expelling more and more foreign wines from our daily consumption.—*Grocers' Review.*

VARIOUS PLANTING NOTES.

TEA SHIPMENTS.—The total shipments for September from Colombo to London were 5,078,000 lb. and the estimate for October is 5½ to 6 million lb. against actual shipments of about 4,900,000 lb. in October 1894.

PEARL OYSTER CULTIVATION.—London, Sept. 6th.—A Frenchman has asked Mr. Thomas Playford, Agent-General for South Australia, for the lease of a piece of the foreshore of the Northern Territory, to be devoted to the cultivation of the pearl oyster.

GOOMERA TEA ESTATES CO.—Good news for Shareholders in this Cympany, comes by the mail, to Messrs. Baker & Hall, in the shape of an announcement of a dividend of 17 per cent for the year ending June, and carrying forward an amount equal to 6 per cent.

CINCHONA BARK AND QUININE—are said to be on the rise, and the New York *Drug Reporter* winds up an editorial as follows:—

The bark situation is daily growing stronger, and another year may see the alkaloid considerably higher than it is today, based solely on natural conditions.

THE CANARY ISLANDS.—We promised our readers a review of Dr. D. Morris's interesting paper on these islands, which recently reached us. We are saved the trouble by being able to take over an excellent resumé and criticism, which has appeared in the *Morning Post*, and which will be found reproduced elsewhere.

EXPORT OF CHINA TEA.—Our Special Telegram from the Far East continues to give us satisfactory news about the export of China tea to the United Kingdom, the total to date being less than that at the same date last year by 2 million lb. The China tea season is generally considered to come to a practical close in this month of October, and there is no evidence of a revival of the trade this year, as some people anticipated.

"HANDBOOK of Horticulture and Viticulture of Western Australia" by A. Despeissis, M.R.A.C., late Consulting Viticulturist, Department of Agriculture, N. S. Wales, Expert of the Bureau of Agriculture of Western Australia,—is issued by direction of the Bureau of Agriculture and a copy has just been sent us for review in our *Tropical Agriculturist.* This will be done; meantime we may mention from a glance that this volume of 338 clearly printed pages is exceedingly well put together with numerous useful engravings, a map of the South-west portion of West Australia—from Geraldton to Albany shewing the Vine and Fruit-growing divisions; and a capital index.

THE NEW SOUTH WALES LAND DEPARTMENT is now offering homestead blocks at 7s 6d per acre, capital value. This low value has been fixed for the first time in the history of the colony.

NEW LIMITED COMPANIES.—A contemporary announces that the next Ceylon Tea Company to be floated will be one to purchase and work three well-known estates in Madulsima. We hear of one or two other new Companies besides to take over adjacent estates in other districts and work them economically by saving separate factories. This is the basis on which we have always advocated the establishment of Limited Companies, and most of the shares in these cases are taken up by the proprietors and their friends. A fourth, or it may be, fifth projected Company is of a somewhat different character, as it is to take up a new lowcountry industry which has already been successfully established. Details of all of these will no doubt shortly appear.

SELANGOR PLANTATIONS SYNDICATE.—The meeting of shareholders of this four months old Company reported in another column, though purely formal in character was of a gratifying nature. Opportunity was given to the Chairman (Mr. Ludwig Huttenback) to state his belief in the future of the Syndicate. This, he did in a happy speech, remarking that the Directors had no reason to alter the favourable opinion, which was expressed by them when shares were offered to the public. In British territory under a friendly official body he had no doubt, that the Syndicate would receive every assistance. From the confident tone of the Chairman's remarks, it looks as if there were good times ahead for the Syndicate.

COTTON AND PEPPER EXPORTS FROM SOUTHERN INDIA IN 1894-95: WHY NOT PEPPER FROM CEYLON IN LARGE QUANTITIES?—The valuable return forwarded to us by Mr. Ralph Tatham for Messrs. Arbuthnott & Co., ought to excite the interest of planters and progressive native agriculturists for this reason. Here is Southern India sending away in the year 1894-95, as much as 151,439 cwt. of Pepper, valued at R2,574,463; while Ceylon with all its advantages of climate, soil, cheap labour and transport, and the fact that a hundred years ago, it was a great pepper-growing and exporting country, and has among the Kegalla Sinhalese, a lot of natives well acquainted with the pepper vine and its ways,—cannot now get up an export exceeding 143 cwt. = R35,115 (in 1894)! And yet pepper is one of the few products for which there is a good and paying demand. We are aware that the veteran Mr. W. H. Wright at Mirigama and some others are pioneering once more with pepper, and we wish them all success. Every tea planter in Kegalla, Polgahawella, Western Dolosbage, the Kelani Valley and Kalutara, ought to find a second string to his bow in "Pepper." In 1650 A.D., Ceylon pepper was the most highly valued in Europe. In A.D. 1740, Governor Van Imhoff considered pepper in Ceylon more important than coffee, and the Dutch, the year before had exported nearly half-a-million lb. of this spice. In 1843, Bennett wrote that the one district of Kalutara ought to grow more pepper than the whole island then yielded. For a long series of years the Ceylon export exceeded 100,000 lb.; now it is about 16,000 lb.! There is no reason why we should not grow and ship up to the value of one or two million of rupees.

TEA PLANTING IN CEYLON.—"Voyageur" must be credited with affording readers of *The Field*, a very lively as well as instructive account of tea planting in Ceylon, and his winding-up will be generally appreciated.

VICTORIA REGIA.—There is now growing in the Victoria Tank of the Royal Botanic Society, in the gardens in Regent's Park, one of the finest plants of the Victoria regia ever seen in London. The surface covered by the plant is over four hundred square feet. There are ten gigantic leaves, each measuring over seven feet in diameter, while several beautiful flowers are open almost at once.—*Standard*, Sept. 7.

ROADS—ROADS—ROADS!—It is very likely that our next Governor's term of administration in Ceylon may be one of the most important as regards "roads" as well as railways and tramways, of any in our record. Not only do we hope to see all the sections of road and the bridges required to serve and feed the Uva railway, taken in hand and disposed of; but the long-talked-of connection between the Southern and Sabaragamuwa provinces by road should be effected, both by way of Morawak and Colonna Korales, and towards Hambantota for the salt traffic—a triune junction would seem to be wanted, the termini being Pelmadulla, Hambantota and Matara. Then again, the Central and Sabaragamuwa provinces should have their road communication by way of Bogawantalawa and Balangoda, apart from district extensions. Tramways in Colombo should at last be inaugurated, and a light locomotive line from Nanuoya through Nuwara Eliya to Udapussellawa, as the pioneer of several more to follow; but, of course, still more important would be the inauguration of the metre-gauge for our Northern, and we trust Indo-Ceylon, railways. Altogether the next five or six years should witness a big step onwards in material improvement in Ceylon.

TEA SEED.—No wonder though tea planting should still be pursued so vigorously in Ceylon, seeing that considerably over half-a-million lb. weight of tea seed valued at R329,000 was imported from India during the two years 1893 and 1894:—

	lb.	R Value.
1893	324,075 —	128,502
1894	207,410 and 9 pkgs.	200,168

Up to date this year, the import is much less, the total being R35,360 as may be seen from the following statement kindly supplied by the Collector of Customs:—

Statement showing the quantity and value of Tea Seeds,

Imported from the several ports of India, from January to August, 1895.

Date 1895		Name of Steamer	Whence Imported	No. of Cases.	Value
January	2nd	ss City of Cambridge	Calcutta	20	1,114
do	16th	ss Logician	do	74	3,373
do	17th	ss Culna	do	62	2,763
do	17th	ss Logician	do	88	4,000
do	18th	ss City of Cambridge	do	201	18,000
do	23rd	ss Virawa	do	6	220
February	1st	ss Newshera	do	77	3,850
do	6th	ss Vita	Tuticorin	4	100
do	6th	ss Amra	do	6	150
March	5th	ss Aska	do	3	100
March	12th	ss Aska	do	3	60
May	13th	ss Aska	do	3	100
June	17th	ss Aska	do	2	1,500
August	15th	ss Vasna	do	5	300
					R35,630

R. REID, Principal Collector,

Colombo Customs, 19th Sept.

COCONUT PLANTING IN NORTH BORNEO.—The Governor of British North Borneo has ordered that any native planting 30 coconut trees in the year shall be exempt from poll-tax The trees will become the property of the planters.—*S F. Press.*

JAVA CO.—The *States Gazette* contains the statute of the Agricultural Company Ngobo in this city, with a capital of fl 300,000, which has been fully subscribed. The company is to work the Ngobo estate in Java. —*L. and C. Express.*

COORG PLANTINO.—The Coorg correspondent of the *Planter* states that Mr. James Chisholm's estates have been converted into a Company: one pound shares. He believes the management remains in the same hands.—*M. Times*, Oct. 4.

PLANTAIN TREES, PRODUCERS OF ELECTRICITY!—A Saigon Journalist has, it is alleged, discovered that the juice of banana trees acting upon zinc and copper batteries, develops electricity. By connecting a number of banana trees, with piles inserted in incisions, he worked a telephone 2.500 metres long for eight months.—*M. Mail.*

FROREN LILIES FROM AUSTRALIA.—The Orient steamship "Ophir" has brought home from Sydney a bouquet of Australian lilies enclosed within a block of ice. They have been sent to the care of the Agent-General for New South Wales with the request that he will ask Her Majesty to accept them.—London *Times*, Sept. 5.

THE HAMPTON COURT VINE.—"Old Colonist" referred to this vine the other day. We read in a paper by this mail:—

That wonderful vine in the gardens at Hampton Court maintains its reputation. Though it is 127 years old, and has once this season been pruned of 2,000 bunches of fruit, it has now over 1,200 "massive clusters" in process of ripening.

ROADS IN NORTH TRAVANCORE.—The beautifully-graded elephant tracks which have for so long been the only substitute for roads in North Travancore will soon be discarded. The very pushing Sylhet Tea Company is now hard at work in finding outlets from their property direct to Cochin. This means sixteen miles of roads through the Company's property and another twenty to the existing road and river service to Cochin.—*Planting Opinion.*

MR. M. A. LAWSON, Superintendent of the Government Gardens and Cinchona Plantation on the Nilgiris, has retired from the Madras service. He was formerly Professor of Botany at Oxford, and in charge of the exquisite garden which stretches along the bank of the Cherwell, which Macaulay described in a well-known passage. Mr. Lawson went out to India twelve years ago, at the instance of Sir Mountstuart Grant Duff.—*Colonies and India.*

THE BORNEO TOBACCO CROP.—We are indebted to Messrs. Mansfield & Co. for the following note of tobacco exported (1894 crop) during this year, the whole of which was carried to Europe by Blue Funnel steamers.

Kinabatangan	2,185	bales against	2,175	(1893 crop)
Darvel Bay	1,058	,, ,,	866	,,
Total ...	3,243	,, ,,	3,041	,,

of the above 2,614 were shipped to Amsterdam,
629 ,, Rotterdam.

—*Borneo Herald*, Sept. 1.

RHEA.—A new use has been found for the fibre of the Rhea. In making the new American yacht "Defender's" spinaker, the material to be used will be Ramie silk. This fabric would, if properly woven, no doubt take the place of cotton, as it is 25 per cent stronger than duck when dry and about 50 per cent stronger when wet. The reason for its very limited use in this respect, writes a contemporary, is due to the fact that only the Chinese understand the art of weaving it perfectly, and as a consequence it is dear. We think that the secret, if any such existed, is now known to others besides the Chinese, and the development of the Ramie-working industry on commercial lines is not very far distant. —*Indian Engineer.*

Planting in North Borneo.—The August crop from the Byte Coffee Estate was piculs 33.35. Some ripe cocoa pods were also gathered.—*North Borneo Herald*, Sept. 16.

North Borneo Cotton.—A sample of Dusun cotton was picked last month at Loong Piasow after being subject to two or three days rain when ripe; the sample was sent to Hongkong and is reported as being of "fine quality, long staple, very clean, free from seeds, and of good colour." It is valued at 18½—19 per picul as against a quotation at the same date of China cotton 17½ to 19½ and Indian at 14-16.—Ibid.

The "Agricultural Gazette" of New South Wales Vol. VI. Part 8 for August, 1895 has for contents:—Honey: Its Composition and Adulteration—F B Guthrie; The Honey Bee—Foul Brood—R. Helms; Bee-keeping—The Inmates and Economy of the Hive—The Queen Bee—Albert Gale; Irrigation—H G McKinney; Harvesting in California—J Martin; Fruits to Export and How to Export Them—A H Benson; Comparative Experiments with Sugar Beets—G Valder; Poultry Notes—S Gray; Practical Vegetable and Flower Growing—Directions for the month of September; Orchard Notes for September; General Notes—Cure of Black Spot; Gumming in Lemon Trees; Sending Specimens to Department; Agricultural Societies' Shows, 1895.

Electricity Sent to a Distance.—Electric power transmission for a distance of 105 miles is proposed by the Kern River & Los Angeles Electric Power Co., of Los Angeles, Cal. Mr. H. Hawgood, M. Inst. C. E., is the Consulting Engineer, and he now has a party in the field selecting the most feasible route for the transmission line between Kern River and Los Angeles. The scheme contemplates the development and transmission of from 10,000 to 40,000 H.P. The plant recently installed at Folsom, Cal., generates about 6,200 H.P., and transmits 5,000 H.P. to Sacramento, a distance of 19 miles, at a tension of 11,000 volts.—*Engineering News*.

Breaking a Monopoly.—With reference to the report that the Travancore Government has decided to abolish the cardamom monopoly against which the planting community has been agitating for years past, the *Western Star* states, that although the Government contemplated the abolition of the monopoly, it has been strongly advised against giving effect to its intention, as it would be practically impossible to assess each holding correctly. It would therefore be the source of regular loss to the Government, and this, our contemporary learns, has been satisfactorily explained to H. H. the Maharajah. The cardamom gardens were all surveyed last year, and a regular assessment will be fixed on each holding, which it is expected, will amount to the average income obtained by the Government from this source.—*Indian Engineer*.

The "Indian Forester" for September, 1895 has the following contents:—Original Articles and Translations—The Chemistry and Physiology of foliage leaves by Dr. Leather; The Cause of the dripping of Water from Forest Trees; A Note on Ceroplastes Ceriferus (white insect wax), by E. Stebbing; How to get rid of blight. Correspondence—Privileges and Rights, letter from B. H. B.-P.; Seeding of the Thorny Bamboo, letter from M Kuppusawmy Chetty; Jadoo fibre: plants without earth, letter from A W Peet. Official Papers and Intelligence—Budget Estimates of the Forest Department for 1895-96; A Note on Plant Assimilation of Nitrogen, by Dr. J W Leather; Peculiarities in the distribution of certain Indian Leguminosœ, by Dr. G Watt. Reviews—Annual Forest Administration Reports of Assam and the Central Provinces, for 1893-94; Report on Revenue Administration in the Central Provinces for 1893-94; Report on the Botanical and Afforestation Department, Hongkong, for 1894; Report of the Agricultural Chemist to the Government of India for 1893-94. Extracts, Notes and Queries—Marram Grass in Australia; Wood-pulp Mosaics; Chemical Wood-pulp; Woodlands in Sussex. Timber and Produce Trade, Extracts from Official Gazettes.

The Possibilities of the Cow-Pea.—A planter who was aware of our interest in the subject of green-manuring has drawn our attention to the cow-pea. This plant certainly has a future before it in our coffee districts, judging from the excellent work it has accomplished elsewhere. Some years ago a few plants were casually introduced in Queensland, where its value was promptly appreciated. Now it covers the best part of that province, where it is utilized in a three-fold manner, the most important of which is manuring the heavily-taxed sugar-cane fields. It can also be used as fodder for cattle, and the seeds form a valuable food for man. It can give two crops a year. It has been cultivated between perennial plants and trees with the most satisfactory results. The yield off one acre is put down as giving almost four thousand pounds of organic matter, which again yields very nearly 65 pounds of nitrogen. We should like particulars of this plant, as its double value for forage and green-manuring makes it take a front place in the list of leguminous plants, our indigenous plants being mostly poisonous to cattle.—*Planting Opinion*.

The Tea in Lool Condura: The oldest continuously cropped fields in Ceylon:—We are very pleased to have the following corroborative report from Mr. J. N. Camphell, Manager of the Oriental Estates Company Limited:—

23rd. Sept.—The oldest tea on Lool Condera viz. the China Jât tea planted along the road sides is now 29 years old, and the oldest field 20 acres of Assam Hybrid is 27 years old. There is also a field of 80 acres of tea now about 23 years old. The whole of this 100 acres was planted in virgin forest at an elevation of nearly 5,000 feet and it is now as healthy and vigorous as ever and continues to give a fairly good crop.

This report and that of Mr. Bonner, are of interest and value to the entire tea planting community in Ceylon. How often, in the early days have our Indian planting visitors come back to us from the Gampola and Dimbula districts with the cry:—"Oh yes, the show is fine; but it is not going to last; a dozen years or so will see these fields worked out:"—and here are fields no better than the average, still yielding well and looking vigorous after 23 to 29 years!

Yatiantotta, 3rd Oct.—Last week brought us a spell of fine planting weather, and those with planting or supplying to do have taken due advantage. Now we are having bright mornings with wet afternoons and occasionally the Peak standing out clear and distinct. Does this mean the North-east monsoon? It cannot now I think be far-off. What I have seen of tea in the district looks very well. The oldest opened fields look as well as they have done any time for the last ten years. Of course here as on upcountry estates there are thin poor ridges which are always more or less backward and as the surrounding bushes expand they give to the casual observer the impression that the bushes on the thin ridges are falling-off. The same inequality of growth and spread of bush takes place upcountry, but the development of the more favoured bushes being slower the contrast is less pronounced. Referring to the question of weeds. It is not likely that we will ever attempt growing weeds along with the tea at least very generally; but the other day I noticed a small field of tea, on the bank of the Kelani Ganga with a complete surface of grass such as grows any where from here to Colombo. The tea belongs to a native and is about eight or ten years old. It had been lately pruned and looked quite healthy in spite of the grass. No doubt it would prevent wash and protect the roots from the sun. At another point on the river I saw a clearing, or rather plantation of arecanuts (grown trees) with the space between planted with tea which looked quite healthy though without much spread.—I think local Postmasters might use more despatch in receiving letters after the arrival of the mails and keep the receiving box open later before time of departure. Fancy, closing the receiving box half-an-hour before the advertised time of departure.—I notice one or two cultivators have commenced harvesting kurrakkan.

Correspondence.

To the Editor.

PLANTING AND LIFE IN NYASSALAND.

Lauderdale, British Central Africa.

July 15th, 1895.

My Dear Sir,—I have just received your *Tropical Agriculturist*, a valuable Magazine I have taken (with a break) almost from its commencement. I have read with a sort of pitying amusement the unfavourable account of British Central Africa by a Ceylon Planter (Mr. Thornton, I presume.) As you appeal to me, I send a few notes, on this interesting case. The Ceylon Planter made a bad start, a very bad start, seeing his fellow passengers began to "eat medicine" on the second day up the river. Perhaps this very unwholesome diet was washed down by even more hurtful potations of spirits, which flow far too freely now: the wail of the C. P. may even have its sources as far back as this.

A young engineer, not a year out from home, certainly died, I am sorry to say, but had been seriously ill for at least a fortnight. Had he been better advised and "eaten" less medicine with unwholesome accompaniments, he would probably have been still alive.

"Any man who goes there gambles with death," so writes our C. P. But I have some figures, carefully made up in 1891, which will go much further than bare assertion, one way or the other. These refer to the employes of the African Lakes Company, which was started by my brother and myself in 1878. Up to 1891 there had been engaged in all 64 men. Three however, had only served a few months each in Africa, four had been dismissed, and one had been drowned on the coast, all of whom I exclude though their aggregate service would have added several years to my figures:—

25 of the rest were either in our employ or had completed their engagements with about..	5¼	years
Average service and a total of ..	130½	,,
22 men had been a shorter time in all	38	,,
5 were invalided, but two of these were consumptive, one of whom would probably have lived even a shorter time at home; the other recovered. These had an aggregate service of	22	,,
4 had died, after serving	9½	,,
56 men, therefore, had completed service of	200	,,

There was, therefore, exactly according to these figures a death-rate of 20 per thousand per annum. But two of these died immediately in consequence of the severe and protracted exertions and anxiety, when we were fighting the Arab Slave-traders at the North end of Lake Nyassa. But for this, the deathrate would have been only half of what it was, or 10 per thousand, one per cent. But not one died in those early and hardest years of all, the first nine years, of pioneering work, of many privations, of occasional dangerous crises, and constant strenuous work. For instance in 1882-3, my first year of coffee work (my brother planted our first patch the previous season) my whole day was spent in out-door work, much of it at the coffee, while I did five nights of office work a week till 12 p.m. or 2 a.m.

But, and I think it accounts for the difference between my figures, and the impressions carried away by your Ceylon Planter, we only employed teetotallers in those early days. If a man *will* indulge in promiscuous drinking, he is not "gambling with death," he is selling his life at a price. We want none such.

I say no more, but shall detain this letter a few days, till I can send you my second year's meteorological record, which has an answer also to the fore-mentioned Ceylon Planter.—I remain, dear sir, yours sincerely, JOHN W. MOIR.

P. S.—29th July, 1895,—Since writing the foregoing an old Capitan or Kangany came up to see me, and *volunteered* the statement, "in the old time no drinking, no one died; now every one drinks and many die."

I trust you will understand my Registers. The large ones are for 3 periods of 6 months each; the smaller for the last 6 months.

Each 6 months is added and averaged, as also each 12 months.

There are some columns to enable me better to foretell the weather, such as a "Crater" and "Chiperone"—the amount of cloud in each, which you would probably leave out.—Yours,

J. W. M.

[The Meteorological returns which are elaborate in detail, will be found elsewhere.—Ed. *T.A.*]

"QUININE" TREE AND MALARIA.

Sir,—The *Madras Mail* is responsible for the following:—

"It has been discovered, says an English contemporary, that the famous tree from the bark of which quinine is obtained furnishes no quinine except in malarial regions. It is therefore claimed that quinine is a malarial poison drawn from the soil and stored up by this wonderful tree."

It is indeed wonderful that such ignorance should be thus countenanced! The fact that the richest barks are grown in regions where malaria is unknown such as in this Naduvatum and Ootacamund district, seems to be ignored!

Quinine is a waste-product in the economy of the tree, which is incidentally formed during the process of nutrition, but not being essential to either growth or nourishment is expelled as far as possible, namely to the circumference or bark of the tree.—Yours faithfully, J. McKENZIE.

[A fashionable London Doctor in a paper on "Influenza and its cure" in the "Nineteenth Century" first promulgated the error alluded to above, and we corrected it at the time in London.—Ed. *T.A.*]

CAMPHOR IN SOUTHERN INDIA.

Sept. 18th, 1895.

Sir,—In former years you included camphor in your column of "Market Rates for Old and New Products," but for some time past that product has not been quoted. May I ask whether you have any objection to include camphor again in the list of monthly quotation at the end of the *Tropical Agriculturist?* It was the study of the progress of camphor as formerly quoted every month in your Market Rates for Old and New Products that induced me to procure seed all the way from Japan.

I may take this opportunity to remark that to the surprise of Mr. Hooper he obtained *solid* camphor from the *leaves* that I sent to him. Only *oil* of camphor is supposed to be obtained from the *leaves* alone.—Yours faithfully, J. McKENZIE.

[We shall certainly resume the quotations: we were not aware it was dropped. We shall be glad to hear of Mr. Hooper's experiments: has he tried the bark?—Ed. *T.A.*]

AN ENEMY OF TEA—THE RED "BORER" ON A LOWCOUNTRY ESTATE.

Hanwella, Salawa Estate, Sept. 24.

DEAR SIR,—I have found in the new field of this estate certain kinds of insects which are called "Parasa lepida," "*Zeuzera coffeæ*," "Eumeta sikkime." These insects destroy the young tea bushes, some eating the bark, some the leaves and others bore holes in the stems and eat the heart of the main stem. I learnt these names of the insects and their forms by reading the book which is called "TEA INSECTS" published by Mr. E. C. Cotes.

I am sorry I buried all the insects I found. I post to you a piece of stem in which you can see the tunnel made by the insects and how they eat. I showed all the insects to Mr. Richard Morgan and he advised me to direct them to you.—Yours truly,

CHAS. A. PIERIS.

[Salawa estate which is now included in the Kelani Valley district has 400 acres under tea; but Mr. Pieris does not tell us if the mischief is widespread, although we gather it is chiefly confined to the young tea. The enemy is the well-known red "borer" to which Nietner first gave a name and wrote :—

"This insect . . . . destroys many trees, young and old, the caterpillar eating out the heart: for this purpose it generally enters the tree six or twelve inches from the ground, ascending upwards. Fortunately it is not abundant. It resembles the caterpillar of the goat-moth of England, is two inches long, and as thick as a goose-quill, nearly naked, of yellowish colour, back red, head thoracic, and anal plates blackish; when full-grown the colours are light and dirty. The sickly drooping foliage, and a heap of globules of conglomerated wood-dust at the foot of a tree soon indicate that the caterpillar is carrying on its destructive work inside. The chrysalis rests three months, and its skin half protrudes from the hole when the moth escapes, which is about February. The moth measures 1¾" across the wings, which are white, spotted with steel blue; the upper ones, with one large spot and numerous series of small ones, placed in rows between the nerves; the lower wings are less spotted. Thorax with four spots near margin. Abdomen variegated with blue. Legs blue, second pair with white femora, third pair with white femora, and tibiæ." Mr. E. E. Green adds that the presence of the insect may usually be detected by the heaps of sawdust-like excrement to be found on the ground under the bush.

With regard to remedies, cutting out infested stems is the most promising treatment that has been suggested, though the damage occasioned appears to be seldom sufficient to make this worth while. In the case of coffee bushes Dr. Bidie remarks (*Report on the ravages of the borer on coffee estates*, Madras, 1867):—"If not much injured, the external opening should be closed with a wooden peg, which causes the death of the borer, and the tree will then in all probability recover." Squirting kerosine oil into the whole or hooking the grub out with a barbed wire would also be likely to be effective in cases where the trouble was worth taking. —ED. *T.A.*]

THE VALUE OF PEPPER IN CEYLON AND INDIAN CROPS.

Dartry, Gampola, Sept. 27.

DEAR SIR,—In your notice of Mr. Tatham's returns of exports from Southern India, you say that in 1894 Ceylon only exported 143 cwt. of pepper=R35,115! Surely there is something wrong here? as this works out R245·63 per cwt. or R2·21 per lb. Southern India exported 1894-95 151,439 cwt. valued at R2,574,463 works out R17 per cwt. or say 15 cents per lb. This, I take it, is more in accordance with the facts, for as a small grower of pepper I know that I had considerable difficulty in disposing of this year's crop at 13 cents per lb. in Colombo. At these prices I don't think there is much inducement to grow it.—Yours faithfully, J. A. R.

[We regret very much to find there was a misprint, the local Customs value was R3,515 or R24·50 per cwt., or not quite 22 cents per lb.; but Customs valuations when there is no duty are proverbially haphazard. The London quotation in our last "T.A." is 2½d per lb. which corresponds with the local 13 to 15 cents. We are sorry to find that our correspondent does not think this price very profitable: is he not rather too high, however, for the proper pepper-growing region of heavy crops? —ED. *T.A.*]

CAMPHOR TREES AND MR. NOCK'S CAMPHOR EXPERIMENTS.

Ohiya, Sept. 28th.

DEAR SIR,—Concerning the Camphor industry, is it not possible that Mr. Nock's failure to obtain camphor, is owing to his experimenting on too young trees? From a short paragraph in the "Scientific American" for August 18th, 1894, I extract the following:—

"The Camphor is extracted from chips taken from the roots or from the stem near the root, the wood yielding about 5 per cent of Camphor, and the root a larger proportion.

*** "Plantations of young trees are also making and are well taken care of, and, although Camphor has not hitherto been extracted from trees less than *seventy* or *eighty* years old, it is expected that under the present intelligent management equally good results may be realized in *twenty-five* or *thirty* years."

From another volume of the "Scientific American", I find that Camphorated oil has been used with success in the treatment of phthisical patients, in Berlin.

This paper also states that the Camphor tree is being domesticated in the United States, and that it was thought it could be produced there in paying quantities.—Yours faithfully,

G. H. G.

[We fear Mr. Green is correct; for Mr. Nock referring to the Formosan process writes:—"It is exactly as I did it except that I allowed no steam to escape, and had a wooden condenser. Perhaps too it was boiled too fast, and I did not keep on for 10 *days*. I'll have an earthenware top made and try again as soon as I can find time."—ED. *T.A.*]

THE KUKULU KORLE: IN DEFENCE AGAINST "HOW IT STRIKES AN OLD COLONIST."

Kukulu Korle, Rakwane, Oct. 4th.

DEAR SIR,—In the *Observer* of 30th ultimo there appears a long descriptive article headed as above, and as some of the remarks contained therein are very disparaging in the reference made to the Kukulu Korle, and "good, old, hospitable Rakwane," I cannot refrain from saying a few words in their defence.

It is much to be regretted that "O. C." "fain" though he was, could not have passed down through Rakwane, and into the much despised Kukul Korle, to refute, with his own eyes, the erroneous statements he has made, and to dispel the gloomy picture which presented itself to his over imaginative brain.

Step down "O.C." from the lofty heights of Vegeria where you have conjured up such strange and gloomy imaginings, and accompany me, and I will guide you through old Rakwane, and shew you fields of as fine tea as you would wish to set eyes upon, and which, for general appearance and paying capabilities, may be equalled, but not surpassed, in any other district of this sunny Isle. Then having feasted your eyes on the luxuriant fields of Barra, Stubton, Hatherleigh and Rangweltenne, let me conduct you up through old "Everton," the scene of your labours "in days of yore,"—alas now so changed—and so on, into the heart of Kukulu Korale North. I will here shew you fields of tea which have given, and are still giving their 600 lb. of manufactured tea per acre. What do you think of that?

You are wrong again "O. C." when you say that the Kukulu Korale is best adapted to the cultivation of cardamoms, for they have been tried and "found wanting."

Your most correct statement concerning the Kukulu Korale is with reference to the leeches, for their wicked little ways seem to have made as lasting an impression on your mind, as they doubtless did on your body, on the occasion of your ever memorable visit to the district of gems.

Now, as to your remarks calling in question the hospitality of the present generation of Rakwane Planters,—well, all I can say is, that you do them a cruel injustice, for although the bungalows are not now so numerous as in days gone by, still in the hearts of the present occupants of the lesser number of bungalows of today, there exists the same love of shewing hospitality—be he stranger or V. A.—as ever characterised the planter of old, with his hearty welcome, and offer of good cheer. Old Rakwane has changed in many ways since the days when coffee was King, but not so its residents, for the hospitality of those of today is like that of their predecessors, proverbial.

With these few remarks, I beg to subscribe myself, ANOTHER OLD COLONIST.

WEST HAPUTALE AND THE MINOR ROAD TO THE OHIYA RAILWAY STATION.

Callander, Ohiya, Oct. 7.

Dear Sir,—My attention having been called to a query in a leader in the *Observer* of Oct. 3rd on the Uva roads, whether the Ohiya bridle-path has been finished, I have the pleasure of informing you that what you are pleased to designate as our "sma' mercy" has been completed and taken over by the Provincial Engineer: and I invite you next time you visit Uva, to come and have a peep at our 'right little tight little' valley and its "sma' mercy," and sniff our Highland breeze. A rickshaw could bring you down at racing speed, but corners might be inconvenient, and don't be alarmed at our milestones: they are made big and heavy that the wind can't blow them out!—Yours,

GEO: H. GREEN.

[We are heartily pleased to have Mr. Green's news and his cordial invitation to West Haputale which will not be overlooked; but surely neither the planters there nor the Railway Managers will long be content to have the traffic carried on coolies' heads (?), in rickshaws or single bullock carts? can a double bullock cart travel on the new road: if not, the sooner there is another vote the better, for bumper crops of leaf over an extended area must be looked for in West Haputale.—Ed. *T.A.*]

VARIOUS PLANTING NOTES.

Sugar Feeding of Cattle.—The results of some experiments in the use of molasses and sugar in the feeding of cattle made at the sugar factory at Libnowes, Austria, are given by Mons. Vivien in *Le Fermier*. The trials extended over 30 days. Twelve beasts had added to their usual rations, for 7 days, 2 lb. 3 oz. of molasses per day; for the following 15 days, 3 lb. 4 oz.; and for the last 8 days, 5 lb. 6 oz. The average rate of each beast before the experiment was 1,120 lb., and, after the experiment was 1,204 lb. being a gain of 84 lb. per head, or a total of 1,008 lb. This is equivalent to a daily gain per head of over 2 lb. 9 oz. Twelve other beasts were experimented upon at the same time, and fed in the same way as the former, except the molasses. In 30 days they increased 784 lb., corresponding to 65⅓ lb. per head, or an average of nearly 2 lb. 3 oz. per head per day. As to the profits, the net gain was calculated as equal to 3s. 8d. per head in favour of the molasses-fed animals. A further experiment is said to have demonstrated that even better results can be obtained by the use of red crystallised sugar instead of molasses.

Coffee is, of course, largely adulterated—says the *Daily Chronicle* of September 10th:—

Of a number of samples collected in different parts of London, 43 in all, no fewer than 22 were labelled "French coffee," and nine of these "contained from 62 to 93 per cent of chicory, etc., averaging 70 per cent of other substances than coffee," and in the 43 samples the average amount of coffee was just 50 per cent. Ginger, too, is sadly adulterated. "The refuse left after the fermentation of ginger, in ginger-beer making, . . . is largely used to be mixed off with unexhausted ginger, and ground together to reduce the price." Exhausted caraways are similarly mixed with fresh. Fine oatmeal is adulterated with barely meal. Beeswax "is extensively sold in Mincing-lane containing as much as 50 to 60 per cent of paraffin wax." Pepper is adulterated with "ground rice, long pepper (which is not a pepper at all), olive stones," and other things. And there was no way of stopping the sale by public auction of 240,000 lb. of pepper-salvage from a fire, which had been soaking in Thames water for several weeks, was saturated with sewage, and had become most offensive. So it was duly ground and sold by retail, though "quite unfit for human consumption." Even candied peel is now made of peel from which the essences have been abstracted. Beetroot sugar coloured with aniline dyes is sold as Demerara sugar. But we must stop.

Cotton Cake.—"Advanced Agriculture." Henry I. Webb, Ph. D., B. Sc. (London). Treating on oil cake as a stock-feeding product, he advises that all cakes be stored in a dry place, and packed in layers at right angles to each other, to admit the air between; this prevents them from becoming mouldy. Mouldy cakes should not be used for feeding; they are often *very dangerous*, sometimes causing blood poisoning and such diseases as anthrax. Decorticated cotton cake is a good food for mixing with others for cattle in winter and about the best concentrated food to give cattle on grass. It neutralises the purgative action of grass; it is very high in albuminoids, and contains a higher manurial value than any other food. It is also an excellent food to mix in a ration for a milking cow, but it should not be given too near her calving period, either before or after. Neither should it be given to stock under one year old, unless in very small quantities mixed with other foods of a more carbonaceous nature. The reason for this food being so unsuited to young stock seems rather difficult to explain, but it has lately been considered that its highly nitrogenous nature acts prejudicially on the liver. Many of these cakes, when badly manufactured, contain hard, indigestible lumps, and should be used with caution. Undecorticated cotton cake, possessing less feeding and manurial value, can only be recommended for cattle out at grass, though it is often used for mixing with other foods for cattle in the winter.—*Home paper.*

ECHOES OF SCIENCE:

A rubber-yielding creeper, the "milk withe" Forsteronia floribunda), has been discovered in Jamaica, through the attempts of botanists to acclimatise the india-rubber tree in that island. The climber is generally as thick as a man's wrist, and reaches the tops of the highest trees and rocks. The milky juice coagulates on exposure to the sun

Gelsoline, the new fibre from the bark of the mulberry tree, is treated like flax, and purified with soap and water to prepare it for the weaving shed. The cloth, as now made in Italy, is ten times stronger than cotton, and only one-tenth the price of flax.

The flowers of the "mahwah" (Bassia lotifolia) are eaten in India. They fall at night in large number, and are gathered in the morning, then eaten raw. They are sweet, but of a sickly flavour and smell. The flowers are also dried and stored as food, especially by the Bheels.—*Globe*.

INDIAN PATENTS.

Calcutta, the 19th Sept. 1895.

Specifications of the undermentioned inventions have been filed, under the provisions of Act V. of 1888:—

For improved process and apparatus for the treatment of Rhea Grass and similar fibres.—178 of 1895.—Henry Hungerford Boyle, Chemist, of London, for improved process and apparatus for the treatment of rhea grass and similar fibres for commercial purposes. (Filed 10th September 1895.)

For improvements in and relating to machines for delinting cotton seed.—196 of 1895.—James Jones Faulkner, Citizen, 94, Poplar Street, in the City of Memphis, County of Shelby, and State of Tennessee, United States of America, Machinist, for improvements in and relating to machines for delinting cotton seed. (Filed 10th September 1895.)

The fees prescribed have been paid for the continuance of exclusive privilege, in respect of the undermentioned invention, for the periods shown against each:—

For cutting and gathering leaves from off tea Bushes.—246 of 1889.—John Ashington Thompson, tea planter, for cutting and gathering leaves from off tea bushes by means of specially constructed shears, scissors, knives, hooks or sickles. (From 3rd November 1895 to 2nd November 1896.)—*Indian Engineer*.

THE TIMBER FUEL OF CEYLON.

We do not remember seeing any analyses of the relative value of the woods of this island as heat-giving and steam-raising fuel. If information on this subject could be collected and published, a considerable service would be rendered to steam users especially in tea factories, and indeed in all factories for drying purposes. As the distances increase over which fuel for estates has to be transported in correspondence with the denudation of proximate sources of supply, this information will become of very considerable importance. There would be direct and large sacrifice of economy in accepting a supply of wood possessing a lower degree of heat-raising properties than could be obtained from the better descriptions. What it is desirable to know is, which woods throw out when burnt, the largest amount of heat and leave the smallest residuum of ash. It must be manifestly unwise to use those woods which offend in respect to the latter quality. We doubt whether hitherto this question has been much studied. The widening area that now has to be traversed before wood fit for fuel can be obtained must however, soon necessitate its study. No doubt the Railway Locomotive Department and the Managers of some of our Colombo Mills have already considered it. There must also be many planters who have, by this time, gained an extensive experience of the woods most efficacious in steam-raising, and we hope that some of them will make the result of their experience generally available. And such results, if collated and published, would be useful in other ways. For instance,—most of us are aware that damp wood fuel is a thorn in the side of the fire-raiser. But perhaps few are aware of the fact mentioned to us by one who has had considerable experience with wood fuel for steam boilers, that a certain proportion of green or damp wood, largely increases the heat of a wood fire burned under draught. There is a tendency when the fuel consists wholly of dry wood to "fly" when the draught is at all strong. An admixture of green wood will not only check this, but the steam given off greatly increases the general heat and promotes that slow combustion which it is desirable to obtain. Even in the splitting of the logs there are specialities, the observance of which has useful results, and these vary both with different kinds of wood and with those that are either dry or damp. Some woods burn better sawn transversely into billets, others yield their maximum of heat when split longitudinally. At all times the best results are obtained when a small proportion of coal can be burned with the wood, the combination of gases yielded by the two fuels largely increasing the heat and promoting ready combustion. Notes on the "topic" we have started from planters or others with local experience would be readily received and utilised by us, for the general benefit.

FRUIT UPCOUNTRY:
LEMONS—AVOCADO PEARS—CHERIMOYAS.

The reproach of our hill plantations having no proper gardens or orchards, is certainly in a fair way to be removed and a few years more should witness a great change. First, we have our friend Mr. J. G. Macfarlane of Ormidale, Maskeliya, writing:—

"There has been a good deal of interesting reading lately in the *Observer re* fruit culture. I send you under separate cover four lemons grown on this estate. What do you think of them? The tree from which they were gathered I planted here about ten years ago."

The lemons sent to us are quite equal in size and flavour to those recently brought from Mildura, Australia, and higher praise we can scarcely give. An orchard of 10 or 20 acres of such lemon trees, would be a splendid addition to a residential property in our hill-country, the crop being worth packing for the old country.——From Lower Haputale, Mr. Maartensz has sent us from the famous Macaldenia Gardens some very fine Avocado pears which though rather too rich and buttery for our taste, we can judge must be as well grown and ripened as any in their native habitat.—Next "Old Colonist" and others will be interested in learning that our latest gift which comes from Mr. H. F. Dunbar of Gampaha, Udapussellawa, namely two well-grown "Cherimoyas" are as fine and luscious as any in the Far West, we venture to say. To Mr. Nock belongs the credit of introducing this fine fruit, the Gampaha tree being grown, we believe, from his seed first put in by Mr. J. Bagra.

What has become of our Mildura friends and their proposed Lemon and Orange plantation?—We hear now of a couple of planters who are

willing to go in for a fruit-garden experiment in the Kalutara district. They have fixed on a piece of land, of no service for tea, near a village and if they get 100 acres at R10 per acre from Government, they would undertake to plant 10 acres yearly with different fruits, and so show the Sinhalese how to grow fruit properly, as well as go on with what might become an important industry. We trust this application will be favourably considered by Government when it comes before it.

PURCHASE OF ESTATES FOR A COMPANY.

An upcountry resident writes :—

"Have you not heard of the new Company? Rozel and Mottingham purchased by Thomson for some £26,700. I mean to take a few shares."

The purchase is, we presume, for a London Company of which Messrs. Whittall & Co., are the local Agents. The two properties named—one in Lower Dikoya, and one in Maskeliya—are returned as follows :—

	Total.	Tea.	Timber and Grass.
Mottingham	258 ..	220	16
Binoya or Rozelle ..	929 ..	441	118
	1,187 ..	661	134

The bargain should therefore be a good one for the buyers.

THE BRITISH ASSOCIATION : THE INAUGURAL ADDRESS.

Ipswich—Cardinal Wolsey's town and coupled by him with Christ Church as "twins of learning"—is favored this year as the place of meeting of the British Association, an Association which has played, and continues to play, perhaps, a greater part in the growth and influence of science (natural knowledge), than almost any other in the world. The names of all our most eminent men are connected with its proceedings, and almost every important branch of industry has benefited by its labours and endowments. This year's President is "Sir Douglas Galton, K.C.B., D.C.L., F.R.S., &c." And no one, wishing to keep abreast of the science of the day, and of its history and conquests during the last sixty years, should fail to read his inaugural address. This address is not, as is so often the case, confined to an abstruse and technical dissertation on some particular branch of science, too learned for the appreciation and enjoyment of the general reader; but is a general survey of the gains that science has made during late years in every department, and can be read and understood by every intelligent person. It is, as usual, very long and the mere enumeration of its headings or sections would take up some space. But it is not too long, and does not contain a word too many, for those who love science for truth's sake, as well as for the many who live by one or other of its ramifications and departments. The immense strides we have made in our general knowledge and industries are herein set forth; and only a very inadequate idea of the scope of the address can be gathered from our reference to some of its subjects. Thus, it opens with a glance at the history of the Association since its foundation in 1831, comparing, generally, the ignorance of that time with the knowledge of today. It was at the instance of the British Association that Government undertook tidal observations at 500 stations on the coasts of Britain; "a subject necessarily of importance to England as a dominant power at sea." It roused Government to make large-scale experiments in Shipbuilding and Naval Architecture. It caused Government to establish a general Registration of Births and Deaths in 1858. It instituted, long ago, an enquiry into the accuracy of Standard Weights and Measures of Length and Capacity; and "in the last session of last Parliament" a Committee of the House of Commons endorsed a recommendation of the Association to provide for a Uniformity of Weights and Measures with reference to the interests of science. In the eighteenth century English artisans were pre-eminent in the manufacture of instruments of precision, so much so; that practical Astronomy was kept mainly in the hands of British observers; "the sectors, quadrants and circles were then inimitable by continental workmen;" and "the foundation of the British Association was coincident with a rapid developement of mechanical appliances in the engineer's workshop." Thus, "a young workman named Joseph Whitworth" realized that the basis of accuracy in "machinery *was the making of a true plane*," a problem he at once proceeded to solve, followed by "an exact system of measurement generally applicable in the workshop." Most people have heard of the Royal Observatory at Kew. In 1842 the Government gave it up, and as the Royal Society declined to take the charge, it would doubtless have lapsed had not the British Association accepted the responsibility, and after having maintained it for nearly thirty-years, at a cost of about £12,000, handed it over to the Royal Society in 1871. These facts will give some idea of the services the British Association has rendered to the country as well as to the Sciences, geographical, geological, chemical, astronomical, mechanical, and physical. Meteorology, Biology (animal and botanical), Anthropology, Bacteriology are all passed under review in this address; while sewage purification, smoke abatement, mechanical engineering (a boundless subject in itself) are all told of in the most interesting manner. Then a good deal is said about the "Influence of Intercommunication afforded by the British Association on Science Progress;" about Science in Germany; assistance to Scientific Research in Great Britain, and a general summing-up. How the British Association works is told in the following words: "Our meetings have been successful because they have maintained the true principles of scientific investigation. We have been able to secure the continued presence and concurrence of the master spirits of science. They have been willing to sacrifice their leisure and to promote the welfare of the Association, because the meetings have afforded them the means of advancing the sciences to which they are attached." Again, "the British Association has distributed £60,000 to aid research since its foundation." The President, in his opening remarks, rightly pays a tribute of respect to the memory of Professor Huxley, who took such a prominent part in the proceedings of the last meeting at Oxford, and, "whose energy and wealth of argument helped to win the battle of evolution, and to secure for us the right to discuss questions of religion and science without fear and without favour."

Sir Douglas Galton concludes his address in these words :—

The various agencies for scientific education have produced numerous students admirably qualified to pursue research; and at the same time almost every

field of industry presents openings for improvement through the development of scientific methods. For instance, agricultural operations alone offer openings for research to the biologist, the chemist, the physicist, the geologist, the engineer, which have hitherto been largely overlooked. If students do not easily find employment, it is chiefly attributable to a want of appreciation for science in the nation at large. * * Every year the field of usefulness of the Association is widening. For, whether with the geologist we seek to write the history of the crust of the earth, or with the biologist to trace out the evolution of its inhabitants, or whether with the astronomer, the chemist, and the physicist we endeavour to unravel the constitution of the sun and the planets or the genesis of the nebulæ and stars which make up the universe, on every side we find ourselves surrounded by mysteries which await solution. We are only at the beginning of work. I have, therefore, full confidence that the future records of the British Association will chronicle a still greater progress than that already achieved, and that the British nation will maintain its leading position amongst the nations of the world, if it will energetically continue its voluntary efforts to promote research, supplemented by that additional help from the Government which ought never to be withheld when a clear case of scientific utility has been established.

CENTRAL TRAVANCORE PLANTERS' ASSOCIATION.

CEYLON AND INDIAN TEA DUTIES.

A general meeting of this Association was held in the Bon Ami bungalow on the 28th ultimo at 10 o'clock. There were present Messrs. R. S. Imray (Chairman), H. W. Baker, J. Burrows, A. R. Cox, R. W. Courtney, J. Finch, R. H. Goldie, W. Graham, B. Laurie, A. E. Veale and G. L. Ackworth (Honorary Secretary); also as visitor of the Hon'ble V. B. Wilbraham. The minutes of the last meeting were taken as read.

Ceylon Import Duties on Tea.—The Honorary Secretary said:—Mr. Chairman, you will have noticed in the last leading article of the *Madras Mail* on the proceedings of the U. P. A. S. I., that my speech on this subject was referred to and the writer of the article demanded what it was the planters of Southern India required. I regret that my speech was not very accurately reported, but I am glad of this opportunity of stating again publicly, that what we want is. that the Ceylon Tea Import Duty should be placed on the same basis as that of India, so far as Indian teas are concerned. At present the Ceylon duty is about 50 per cent *ad valorem*, whilst that of India is only 5 per cent. Ceylon teas are therefore admitted into India practically free, whilst an absolutely prohibitive duty is placed on our teas in Ceylon. This is not only unjust but unstatesmanlike, as the two countries, whose interests are identically the same, ought to run hand in hand. We have no wish to relieve China of any other inferior teas, but our teas are as good as those of Ceylon, and ought to be treated on the same footing as the latter are in India.

VARIOUS PLANTING NOTES.

THE COFFEE ESTATE of Messrs. Ramsey and Harrison at Singgora is said to be promising very well. Several hundreds of acres of very rich soil are under cultivation and the only difficulty the proprietors have to contend with is that of obtaining labour.—*S. F. Press.*

"TROPICAL COLONISATION."—Under this heading we give an article of fascinating interest from the *Spectator*. Special mention is made of Ceylon, in most flattering terms as to beauty of scenery, richness of vegetation, goodness of climate; but we agree with the editor rather than with Mr. Boyle as to the main question in dispute; and there is in this island, the experience of a century of British occupation and sixty years of planting settlement to point to, in support of the *Spectator's* argument.

ODDS AND ENDS.

(*From an Ex-Rangalla Planter.*)

THE TEA BOOM.

The name of Ceylon no longer stinks in the nostrils of city men and speculators, and the one thing that all and sundry long for is the possession of some shares in the big dividend-paying tea companies, such as Yatiyantota, Yataderia, We-oya &c. &c. and now the much abused Castlereagh Company and Clunes Limited have come with a rush and intend paying handsome dividends, like the rest. Those shareholders, who, putting no faith in Mr. L. H. Kelly, sold out at R65 must feel a trifle sick when they see Castlereaghs quoted at R140, while, I can fancy, a benign smile playing around the chiselled features of L. H. K. Although rejoicing at the success of the Ceylon Planters, I would fain utter a word of warning, and would advise them strongly not to put too much faith in tea, but to keep some other irons in the fire. In Cacao for instance there is likely to be a boom since the interesting test was made recently by a French woman, who, with a view of testing the sustaining powers of chocolate, lived upon that alone for 60 days, and lost only 15 lb. in the interval. In these depressed times, to be able to live for two months on chocolate alone is a policy likely to be adopted by the thrifty, and so cocoa will be in demand. Planters, who are drawing big dividends from their tea shares, should also remember that tea can be grown in almost any country, the latest to enter the lists being Russia, where they are growing magnificent tea on the Caucasus, one planter there having received a firm offer of 20,000 roubles for his next season's crop. In New Zealand, Australia and the Cape tea grows well, the only advantage Ceylon has against these countries being cheap labor and continuous flushing, and this brings to me the subject of the

TUNDU-MANIA.

What has gone wrong with it? In the days of King coffee there was no trouble about tundus, one planter never dreamt of taking a mean advantage of another, so why do they do so now? The correspondence on this subject, which appeared in the *Observer*, was exceedingly silly, and the stupidity of it reached a climax when a "Buchan Loon" rushed into print with his experience, which he had, no doubt acquired in the Bog of Ardallie, or some other festive spot in Buchan. He modestly admits that conceit is characteristic of his native wilds; an undoubted fact, for, sometime ago, I pointed out, in these notes, that another Buchan Loon, Mr. Marr, had been lecturing, in Scotland, on Ceylon, he having spent a fortnight in your island, and his knowledge of the palm-fringed isle having been acquired amongst the Clydesdale horses of Cairnbrogie. The labour question apeared to me to have been threshed out by Mr. E. J. Young in his pamphlet on Indian labour fields: why don't the planters read that? They were willing to pay Mr. Young for going to India on their account, and yet they don't seem disposed to read what he has to say on the matter.

TEA-TONER.

—A new tablet just brought out in London is finding a place on the tea tray. It is a tea-toning lozenge, which is dropped into an infusion of tea and acts as a solvent to the tannin never absent from even the most delicately brewed of this beverage. Its component parts are gelatine and alkaline salts, and its alleged office is the neutralising of any injurious digestive effect of the cup which "cheers" —indeed at the moment of drinking, but often chides bitterly afterwards.

MODERATE CARELESSNESS.

Mr. Mackwood's allowance for moderate carelessness in the tea factory seems a peculiar idea, and would be all very well, for us home buyers of your tea, if the carelessness took the form of putting too much into the chest, and not, everlastingly, too little. Tennis has a great deal to answer for, but short weight in the tea chests is certainly a very reprehensible thing to lay to its charge.

OLD DISTRICTS.

It is cheering to read such accounts of the old districts, as appeared in a late *Observer*. Dumbera natives getting their gardens weeded, in expectation of a crop of coffee, and Rangalla natives enjoying prosperity through the tea enterprize. Fancy Rangalla with telephonic communication, cart road to Nitre cave, a Church—and no necessity for a constable at that centre of commerce, Udispattu. I hope the Dumbera natives are not trusting to the talented Mr. E. F. Wright and his cure of leaf disease. Mr. Wright is not the first man who expected to draw in the Government reward of £10,000, but their names have long ago passed into oblivion, and the reward remains in Government hands still.

COSMOPOLITE.

TROPICAL COLONISATION.

We wish we could heartily agree in the views of Mr. Frederick Boyle, but history, we fear, forbids. That gentleman, who has much and varied experience of tropical lands, argues, in the *New Review* for this month, that the English belief as to the impossibility of Europeans colonising tropical countries is a baseless, as well as an embarrassing, prejudice. We shall have to do it, he says, for the temperate regions are either getting full, or being closed to immigrants by the jealousy of their occupants; and we may therefore as well reconsider the objections to settling in the tropical or, to be more exact—for the description which includes Northern India in the tropics is a little vague—in the hotter regions of the globe. Mr. Boyle finds most of them unreal. That man as a being does not degenerate physically in the hot countries seems to him certain, and we should admit that the evidence is for the most part wholly on his side. The Bengalees may be allowing to be "a feeble folk"—though there is great exaggeration even about this—but the Arabs, the Soudanese, the Southern Chinese, and almost all negroes are remarkable for muscular strength, power of enduring fatigue, and physical energy in general. They have less perhaps of the habit of living than Northern Europeans—though half the centenarians of the world are negroes—but that probably results from special circumstances, the English from the twelfth to the eighteenth century having died at least as fast as any dark tribe. If they had not, they would have increased in number at a much quicker rate. The dark peoples are, in fact, as "strong" as Europeans; while as to courage, the Soudanse broke a British square, the West Indian negro soldiers can be entrusted anywhere, and if the daring of the South Chinaman is doubtful except when he is a pirate, no one has ever questioned that of the Malay, either in battle or in the wild adventures which led him to Madagascar and the islands of the Pacific. Nor is there much evidence of intellectual decay, for if the world owes nothing to the negro, she takes all her creeds from the men of the hotter lands, and the clearest-sighted professor in Europe is not superior in power of subtle thought to the Brahmin of Madras. If, then, man as a genus does not necessarily degenerate in the tropics, why should the white man, his most energetic species, degenerate either? As a matter of fact, there are families of Jews which, without mixing their blood, have retained all energies, in Persia, Bombay, and even Bengal, for centuries; while the people of Costa Rica, who are "nearly white," are a singularly hardy peasantry, and we may add the Copts, who, if not white, are as nearly white as the Jews, are still the most competent race in the valley of the Nile. Neither the Ptolemies nor their soldiers degenerated in Egypt and there are Spanish families in Mexico as strong and as able as ever their progenitors were in Old Spain. Why then, asks Mr. Boyle, should not some State try the experiment of a tropical Colony, which, if it succeeded, would open such vast regions to European immigration, nay, might even produce a race greater than any now existing, for Mr. Boyle sympathises a little with the naturalist, Mr. Bates, who, after years spent in the forests of Brazil, chiefly in the valley of the Amazon, found himself so fascinated by the vigour of Nature in the tropics that he wrote:—"The well-balanced forces of nature maintain here a land surface and a climate that seem to be typical of mundane order and beauty.........I hold to the opinion that, though humanity can reach an advanced degree of culture by battling with the inclemencies of nature in high latitudes, it is under the equator alone that the race of the future will attain to complete fruition of man's beautiful heritage, the earth."

It is a splendid dream, because it opens up new and almost infinite possibilities for the white race now dominating, though it does not colonise, all the continents; but we fear a dream only. History is opposed to Mr. Boyle. To begin with, that must have been a powerful instinct or a most operative law which originally divided mankind, so that the white race was confined to Europe, that the black race populated Africa, and that the huge bulk of Asia, the most fertile and tempting of all the continents, was filled with yellow and brown men. A scientific theorist would certainly say that some immutable law of convenience alone could have produced that result, which, amidst all the endless mutations of history, has remained substantially unchanged. Europe and Asia have fought for ever, but the bulk of the populations have remained European and Asiatic, while the great Roman invasion of Northern Africa and the Vandal invasion which followed it, alike ended in the triumph, more or less complete, of the brown races. Historians suggest no explanation of this cardinal fact, nor is any, we think possible, except that, whatever the meaning of the mysterious law of race—and science in no way accounts even for colour—the white peoples flourish best within strictly temperate regions. They can flourish in the highlands of the tropics, but they do not reach their highest level, and tend, when attacked for ages by autochthons, to recede, as they have done in Egypt, and are doing in many parts of Spanish America. It is probably true that they can labour in the tropics, for the white mechanics of the Southern States of the Union live and work there, and possible that, as governing castes, they would in the tropics develop marvellous energy; but they almost certainly would not advance as rapidly as in Europe. Englishmen are, we think, for some unknown reason, habitually unfair to Spanish Americans, who, whether pure or crossed, have produced men of singular daring, energy, and power of endurance; who have built great cities and reclaimed great regions of the earth; and who have besides a power of absorption and attraction acknowledged by all who settle in Spanish America, Italians more especially; but it would be foolish to say that the owners of Brazil or Central America or Mexico show any symptoms of developing into the superior race of mankind. Pure or crossed, an optimist would hardly say of them that they were better than their ances-

tors in Old Spain or Portugal. A "Southern gentleman" of English blood is often a very fine man; but he is not so much nobler than an English gentleman that he can be quoted to prove the truth of Mr. Bates's dream. That the hot lands are not fatal to energy may be true; but certainly they do not, with all their natural advantages, ever tend to produce it. If they did, the most glorious of all tropical countries, Ceylon, would have produced a grand race; and it has not done it. There, with land of all altitudes, and all kinds of powers of production, amidst perpetual summer and scenes which, if the theorists are right, should have bred in them an abnormal sense of beauty, dwells a race which we have no wish to decry, but which is certainly not more distinguished than, say, the Belgian or the Swede for any high qualities whatsoever. Whether an admixture of white blood would have altered the result, as we understand Mr. Boyle to half believe—at least if he does not believe it, we do not quite comprehend the drift of his remarks on the cross-breeds—is still an unsettled question; but it is clear that in the Southern States of the Union, in Spanish America, and in India, such admixture has not developed any markedly superior race. Mr. Bates's hope is a dream.

We should say, on a review of the whole evidence, that it pointed to this result. It is probably much more possible for white men to colonise a tropical country than is imagined, especially if the colony was so organised that sanitary laws could be enforced from the very first; but the first generation would suffer terribly from unaccustomed diseases—low fever, for example—from the depressing effect of a change of climate, and from the shock involved in a violent change of daily habitudes as to diet, hours of labour, and general social life. This suffering, involving much mortality, would discourage the average colonist to such a degree that he would not remain for the time which even Mr. Boyle admits to be necessary to secure complete acclimatisation. No generation of men will devote itself in this way for the benefit of its successors, and every experiment will therefore end either in failure, or in the importation of races able to relieve the colonists of all severe or exhausting toil. The second alternative may succeed,—has, for example, succeeded in Louisiana; but that is not colonisation by white men. It is "settlement,"—a very different matter, and one which cannot be said to have been as yet fairly tried. We can quite conceive of both the world and the whites being benefited by the settlement of a tropical region, in which dark men shall labour, and white men, few comparatively in number, shall guide their labour, and, while reaping a profit out of their exertions, shall deliberately endeavour to keep up among them a high and improving standard of civilisation. A body of white colonists working as a hieratic caste, and governing in the interest of the labourers as well as their own, might produce, under favouring circumstances, such results as the world has never seen, a civilisation in which poverty, disease, and crime were almost entirely absent, and the whole community exulted in struggling forward to some lofty ideal. The experiment, however, has never been made, except by the Jesuits in Paraguay, and it is difficult to imagine how it could succeed. The guides become arbitrary or the guided rebellious, or in the end some adroit man avails himself of human foibles to seize the reins of power, and we have, as under Dr. Francia and his heir, a pure despotism which advances nothing, because in the interest of the despotism individuality must be put down. We rather wonder, however, that the experiment has never been tried by laymen, who with a healthy African district before them, and two regiments of black freedmen from America, might achieve, for a time at least, a considerable result, and would certainly add considerably to the knowledge of mankind. A good many *phalanstères* have been started from time to time, and a philanthropic Baron Hirsch might try that one with some faint hope of success. It would, however, be a faint hope, the law of ages being clearly that Europeans and Asiatics and Africans will not, unless coerced by irresistible circumstances, work in continuous harmony together.—*Spectator.*

PLANTING AND PRODUCE.

Cocoa Adulteration.—On this subject Messrs. Cadbury Brothers write: "It may be true, as stated by a writer in the *Times*, that many 'of the leading manufacturers and the Government in the victualling yards' add 50 per cent. of sugar and arrowroot to the cocoa they prepare, but the word 'all' is incorrect. Our firm, which clears between one-third and one-fourth of the cocoa imported into Great Britain, has resolutely set its face against all such admixtures. Our cocoa is absolutely pure, and does not contain any addition of sugar or starch, nor any of those alkaline salts added by many of the Dutch makers to produce their dark-coloured and scented cocoas. Mr. George Cadbury, a member of our firm, in giving evidence before the Foods Adulteration Commission of 1872, proposed that the exact percentage of all the ingredients used in the manufacture of any articles of food should be distinctly given on the label. To this opinion we adhere, and believe the public would soon learn its value were it carried out. Tho public understand chocolate to be an article containing sugar and flavouring matters, such as vanilla. Our remarks, of course, only apply to brands offered as 'cocoa,' which as a beverage need not contain any starch and sugar, still less any addition of alkaline salts."

Shade Trees and Coffee Planting.—Mr. Robert Thomson, who was for many years at the head of the Government gardens and plantations in Jamaica, has furnished to the Foreign Office for presentation to both Houses of Parliament an interesting report on the agricultural products of Tolima, in tho Sierra Nevada of Colombia. He points out that in recent years a great impetus has been given to the cultivation of coffee in Colombia through the systematic interplanting of shade trees with coffee plants. The value of the coffee exported from the territory has increased from 810,000 dols in 1877-78 to 10,000,000 dols in 1894; and it may be assumed that in the course of two or three years the value of the total output will amount to 15,000,000 dols. Mr. Thomson mentions that thousands of acres in the district in question are being gradually reduced to a desert by the practice of burning the natural grasses during the most scorching periods of drought for the purpose of obtaining new and tender pasturage, and that the soil, is only preserved from sterility by tho chaparro tree, which appears to flourish in consequence of tho fires and the leaves, which form new vegetable mould. —*H. and C. Mail.*

SALE OF THE MESSRS. CHAMBERLAIN'S BADULLA ESTATE.

We learn that Mahapallagalla estate, Badulla, has been sold by the Messrs. H. & W. Chamberlain (brothers of the Rt. Hon. Joseph Chamberlain, M.P.) to the Nahavilla Estates Co. for the sum of £7,000. The property includes 323 acres, of which 47 are in coffee, 200 in tea, 26 acres fuel trees and the rest patena. It ought therefore to be a bargain for the Company.

SULPHUR AS A CURE FOR RED SPIDER IN TEA.

To the Editor of the *Home and Colonial Mail.*

Sir,—I regret not having had an earlier opportunity of examining, in your issue of the 30th ult., my two letters on "Sulphur as a Cure for Red Spider," which you were good enough to publish. In the one of April, 1893, which you reprint, several slight abridgments have been made,. to which I take no objection, but, on the contrary, feel obliged that you devoted so much of your valuable space to the subject. But there is one serious omission of half-a-dozen words from the seventh paragraph from the beginning of that letter, on the "process" of applying the sulphur, that I trust you will kindly permit me to call attention to.

That paragraph should commence as follows: "Our process of application is simple and inexpensive. We put the sulphur in gauze bags or cloth of open texture, and after wetting the bushes thoroughly over and under the leaves, and the branches and stems, *by means of large hand garden syringes*, the sulphur is dusted over the whole bush," &c.

The words omitted—whether from a defect in the copy you had or through an oversight of the printer I know not—are in italics.

Apologising for again troubling you, and thanking you in anticipation for making this most necessary correction.—I am, &c., GEO. W. CHRISTISON.

WHAT WILL NORTH BORNEO'S CHIEF EXPORT BE?

TAPIOCA.—Here is a cheap article of general request that can be grown to any extent on the banks of the rivers and waterways round the Bay and from thence floated to a central manufactory, while as to the demand, tapioca stands on much the same footing as sago; produced now in large quantities any material rise in the price of wheat would entail a sufficient rise in the price of tapioca to cause a vast increase in its production in countries best adapted to its cheap growth, manufacture and transport; and what country is better adapted to these ends than North Borneo?

Last year's export from Singapore alone of the various products I have spoken of, (sugar, Manila hemp and cotton omitted as they are not grown in the districts for which Singapore is the port of shipment) are as follows:

Gambier.	Sago.	Copra.
682,000 pcls.	695,000 pcls.	841,000 pcls.
Rattans.	Tapioca.	Coffee.
271,000 pcls.	372,000 pcls.	61,000 pcls.

making a total of 2,922,000 pcls. or say 172,000 tons. All these things we can grow just as well, as cheaply, and as profitably in the Sandakan district as in the places from whence those large supplies come; while the area of land centreing upon Sandakan is large enough to grow every picul as well as sugar enough for the Hongkong refineries and cotton enough for the Japan mills; no one I presume queries this; but when are we going to begin?

Which ever products offer most inducements to the capitalist are likely to be the things that will be most largely cultivated at first and a combination of quick returns and good profits are the points likely to have large influence on the question; the following list gives the length of time within which the various plants mature:—

Cotton	commences	to give	crop in	8 months
Sugar Cane	,,	,,	,,	9 or 10 ,,
Tapioca	,,	,,	,,	12 ,,
Gambier	,,	,,	,,	15 ,,
Manila Hemp	,,	,,	,,	20 ,,
Coffee	,,	,,	,,	30 ,,
Rattans	,,	,,	,,	48 ,,
Coconuts	,,	,,	,,	60 ,,
Sago	,,	,,	,,	140 ,,

But various other considerations have to be taken into account; a great deal depends upon which of these products receives attention first; for trial is synonymous with success and profit, and success and profit will mean the following up of that particular cultivation. Now the plants that are receiving most attention at the moment are in the order named coffee, sago, coconuts, gambier, Manila hemp, cotton and sugar. There is no doubt that coffee successful as it is will be followed up, but to do so on a large scale requires a good deal of capital and elaboration. Sago-palms will be planted in increasing numbers, but new plantations takes too long to crop to figure in an export sheet for years to come. Coconuts are planted in the Sandakan district at the rate of some 20,000 per annum, a rate likely to be accelerated in the future rather than reduced, but they also are a long crop: gambier is well in hand, the gardens are being increased in size, the leaves take but a short time to mature and at present prices the manufacture gives large profits where the transport bill is not too high, and gambier is the product that I expect to see exports of increase more quickly during the next few years than anything else, always remembering that it is in the power of sugar to go ahead and take a commanding lead at any time and at short notice. Manila hemp owing to the want of skilled labourers on the one hand and to the small returns it offers to the capitalist on the other will make its way but slowly, but it will give good and certain rents to the large land owner on the one hand, and a Manila hemp patch is a sort of bank that can always be drawn upon when the small occupier wants money on the other, so that although its increase will be slow it will be sure; cotton also does not promise large profits to the capitalists although it offers several attractions to the small occupier, but it may be that millowners in China and Japan may demand it and put their money in for other reasons than the profit the crop itself would pay and then it would rush ahead in a way second only to sugar. Sugar is barely started yet, but when once a start is made it will go ahead by leaps and bounds.

Demand is another factor in the matter; for sugar and cotton, the demand is practically unlimited, as also it is but on a smaller scale for coconut products, for coffee it is very big but there is a limit, for gambier the demand is smaller, but the area of production also is small and is always decreasing, for Manila hemp the demand is bounded by very well defined limits, while for rattans there is no probability of ever our producing them in such quantity as would affect prices; while tapioca and sago stand on a somewhat different footing, when wheat rises as rise it must some day the demand for these two products is capable of indefinite expansion, that the price of wheat will be over 40s per quarter twenty-five years hence is pretty certain but how much sooner?

Considering all these points therefore I am inclined to think that gambier will be the first product to go ahead largely and to hold the lead in our export list for a few years, but then I think sugar will pick it up and pass it by with coffee and coconuts third or fourth.

If I made a bet now as to the values of exports 20 years hence I should back (but should want long odds) sugar to be first, gambier second copra third, coffee fourth, cotton fifth, tapioca sixth, Manila hemp seventh, rattans eighth and sago ninth, and for a long shot at the future I should expect to see sugar always an easy first, sago second, tapioca third, cotton fourth, coffee fifth, copra sixth, Manila-hemp seventh, gambier eighth, (owing to the land for it being mostly worked out and then probably planted with tapioca) and rattans last.

Cocoa, India-rubber, tobacco, oranges and pumeloes pepper, nutmegs, arrowroot, betelnuts and various other agricultural products are likely to be exported in more or less quantities from the country; but never I think tea, cinchona or cinnamon, (always avoid anything Ceylon can really produce). If the cultivation of rice or of Indian-corn is taken in hand in the course of years, these things will very likely become large exports, and there is no knowing what else may turn up but as far as I can judge my remarks bound present probabilities. MYNAH.

—*N. B. Herald.*

CENTRAL AFRICA.

(From the British Central Africa Gazette.)

(Zomba, Aug 1st.)

Mr. Stotesbury, of the Survey Department of India, and a staff of Indian assistants have arrived in this country to undertake for the Government the systematic survey of the land in the protectorate. His work in addition to that of Messrs. T. H. Lloyd and Anderson would soon bring about the authoritative survey of all estates, and greatly facilitate the land settlement. Careful attention will be given to the mapping of native reserves.

Mr. Poulett Weatherly, the well known sportsman has written us an interesting letter from Momora, in the Ulungu country, south of Tanganyika, a portion of which we propose to publish in our next issue. Mr. Weatherly has started on a ten months' exploration through the Awemba country over a district quite unkown to Europeans.

Dr. Percy Rendall writes:—"During a visit I made to 'Woodlands' (a country house near Cape Town) I was interested to note a large herd of fallow deer that were being transferred to the Zoological collection in Mr. Rhodes' grounds. As far as I can ascertain fallow deer have never been acclimatised and bred in South Africa before. In addition to these, I saw Burchell's zebra and eland in captivity in the grounds of the High Commissioner."

JAVA QUININE.

The Java quinine-factory scheme, after many troubles, is now approaching completion. A syndicate of four gentlemen have sent out a circular saying that they have been supplied with funds for the erection of a factory which they propose to "locate" near Bandoeng. The factory will not purchase bark outright, but charge a fixed price for manufacturing—viz., 11s 8d per kilo, for quantities between 400,000 and 600,000 kilos per annum; 10s 10d per kilo for quantities between 600,000 and 900,000 kilos; and 10s for still larger parcels, calculated upon an average of 4 per cent quinine. It is thought that the Government gardens will assist the factory by sending their bark to it for extraction. The co-operation of many of the largest private planters has also been secured. The factory will commence with an annual capacity of 600,000 kilos bark. It is thought that from 15,000 to 20,000 kilos of the quinine made can be sold in Java and the neighbouring Dutch colonies. The trouble, it seems to us, will be to prevent the prepared quinine from being "slaughtered" on the European markets in the same way as the bark is now, for no provision is made to keep the manufactured product in the control of a central sale-office. On the contrary, it is to be handed back to the planter who supplied the bark, and who will, therefore, be under the same temptation to sell with regard to quinine that has been his undoing in the matter of the mother substance.—*Chemist and Druggist.*

INDIA AND CEYLON TEAS IN AMERICA: STATISTICS SHOW THAT THEIR SALE IS ON THE INCREASE.

Under the above heading the New York *Mail and Express* publishes the following:—

"Consumption of India and Ceylon tea in the United States and Canada is rapidly on the increase. In 1890 there was a total consumption of 2,100,000 pounds. In 1894 the figures were 5,200,000 pounds. These teas are pure and machine rolled.

"To one who has seen the Celestial at work rolling the tea leaves in his hands, the best recommendation that can be given to the India and Ceylon products is that they are machine rolled. Thus all foreign substances are kept out of the machine rolled India and Ceylon teas. They are also relatively cheaper than other brands. According to the statistics of the English Chancellor of the Exchequer, three pounds of them go as far as five pounds of Chinese or Japanese teas. They find a ready sale in the markets."

The same issue contains a clever and very much up-to-date advertisement of Ceylon and Indian teas. The "Valkyrie" and "Defender," the former flying a flag with "India" and the latter a flag with "Ceylon" imprinted on it are engaged in a neck and neck race while behind lay two junks "China" and "Japan." The letterpress in connection with the illustration says:—

"'Good Thing, Push it Along.'—The above diagram shows the types of the fastest yachts afloat, as well as of the old Chinese junks. There is as much difference between "Defender" and "Valkyrie" and the old-fashioned junk as there is between the delicate, well-flavoured, machine-made India and Ceylon teas and the hand-rolled and lead-colored Japanese and Chinese article. The comparison is striking, you say! Try the teas and be assured of the statement. Insist on your grocer supplying you with Ceylon and India teas. Three pounds of India and Ceylon tea go as far as five pounds of China and Japan teas."

The *Brooklyn Daily Eagle*, which gives prominence to the same advertisement has the following:—

"MACHINE VS. HAND MADE TEAS.—Tea drinkers in the United States have discovered that teas grown in Ceylon and India, being machine rolled and not subject to objectionable treatment by the hand, are more desirable than the Chinese and Japanese teas. Furthermore, no foreign substances are used in India and Ceylon teas for coloring the product. As to price, the English Chancellor of the Exchequer says that three pounds the former is equal to five pounds of the latter. The consumption of these British teas increased in 1890 from 2,100,000 pounds to 5,200,000 pounds in 1894."

The advertisement referred to and the figures quoted also appear in the *New York Daily News.*

The above was in type yesterday. Today's Kandy post brings us a packet from the Secretary of the Planters' Association giving cover to two letters (and sample advertisement cuttings) addressed to Mr. Wm. Mackenzie by Chicago and Toronto tea dealers; but the names are not given. The former has started "the Monsoon Tea" and has apparently been subsidised with a supply of circulars and 4,000 dollars, with which we are told a great work has been done in Chicago and the Western States in making known "the Monsoon" (pure Ceylon) tea. But they now want 10,000 dollars more from "both Associations" (? Ceylon and India—5,000 each) to work the East and South—including the Atlanta Exposition (which we had thought the Commissioner and Committee of Thirty had blown out of all consideration!). Here is perhaps the most important passage in the Chicago letter:—

"I do not know whether my plan of introducing Ceylon teas is the best or not, but what can be said of it is this: that two years ago scarcely a pound of Indian or Ceylon tea was used in Chicago or the West, and now every good grocer both here and over the Western country is offering it for sale, and repeat orders are coming in daily—sales amounting to about 400 half chests per month of 'Monsoon' alone."

Surely the writer does not mean that all the credit of the change is due to him or his plan? He calmly ignores the International Exhibition altogether!—The other letter is a much shorter one and is apparently from a Firm exhibiting in a Canadian Food Show and mentions that thousands of cups of tea are being served out daily. The diagrams, and the ad-

vertisements of the "Monsoon tea", are certainly very striking. The Commissioner himself sends no comment on the letters (or advertisements) and these being without names, how are we to know what weight is to be attached to them? Surely it would be more business-like for the Commissioner to give a fortnightly or monthly report on what is being done, summarizing the letters of agents. But we much fear that trouble will arise through the subsidising of a few favorite firms or individuals and the neglect of others? That is a matter, however. for the Commissioner and Committee of Thirty to decide. We can only rejoice in all the evidences of advertising on a big liberal scale, brought before us, because we feel sure that this is the way to make our teas known and to lead to an extension of the demand for Ceylon teas.

FAILURE OF FIJI AS A TEA, &C., GROWER.

FAREWELL DINNER TO MR. A. J. STEPHENS.

A Great Deal about the Colony and its Prospects.

Taviuni, August 31.

Without the sensible and true avouch of our own eyes and ears, we might not have believed a few month's ago that there was any foundation for the rumour that it had been decided to close the Alpha Tea Estate, although wo knew full well that its capable manager had been bravely fighting the fates for some time past. Now, all too well know the truth, and Mr. Stephens' friends have gathered round and have right royally done honour to one who has so manfully done honour to himself and his avocation. Too well, we all know the disadvantages at which he was placed to make the Estate the success the product deserved, for a better quality of tea is not produced here nor in any other of the tea-growing countries of the world. It was hoped up till the last that Mr. Stephens would not find it necessary to leave Fiji, but those hopes have now become blighted and we, here, paid a last tribute to him we like so well by being present at Mr. Tarte's residence on Friday evening, invited by that gentleman to a dinner givon in honour of the departing pioneer. Exeepting our popular medico (Mr. F. S. Finucane), who was unavoidably absent, all tho leading Vuna Point planters and residents, including Mr. Stuart Black of Selia Levu, Mr. J. Guilliam Scott, of tho Bank of New Zealand Estates Company, and Mr. H. Monckton, S.M., of Taviuni. After doing justice to their "inner man" off a table tastefully arranged with delicacies innumerable, even for our most pronounced epicures,

Mr. J. V. Tarte, the host, asked all to charge their glasses and drink the toast of the evening, "Our Guest, Mr. A. J. Stephens." He said:—It is with mingled feelings of pain and pleasure that I rise to propose the toast of the evening, "Our Guest, Mr. A. J. Stephens." With pain to think that we are so soon to lose from our midst a pushing energetic man, a kind neighbour and a sincere friend. (Much applause.) I remember some 17 or 18 years ago being on the Levuka Beach, when a tall dashing fellow hastily passed me, with a hat which for size and stylo I won't forget in a hurry, and on my asking who that was, I was informed, "O, that is one of those Ceylon fellows, who has come down here to show us how to grow coffee and tea." Gentlemen, notwithstanding the envious sneer, he has shown us how to grow both, for well I remember the glorious sight I witnessed when on an invitation from him and his partner, the late Hon. J. E. Mason, I visited Alpha and saw the glorious prospects that were before them by the appearance of their coffee plantation—prospects, however, which were never to be realisod. That fearful seourge, the coffee leaf disease, breaking out, simply annihilated the lot. However neither he nor his partner were the men to sit down quietly and suffer defeat. No, if coffee were a failure, they would try tea, and on that, gentlemen, I need not say much as you all know the success achieved in growing it and its quality. Alpha tea is a household word in Fiji and, wero it not for the labour troubles and financial difficulties of the Company he represented of late, preventing him going into it on a large scale, it would have been as well known in the outside world as Ceylon tea is. Before sitting down I have one more pleasant duty to perform in presenting him with an address signed by all his fellow planters and residents on the island, and am sure he will appreciate it all the more when I tell him it was done by a fellow-planter as a labour of love, and for beauty and artistic design it could scarcely be excelled. Gentlemen, with your permission, I will now road and present it.

ADDRESS TO ARTHUR J. STEPHENS,
late of Alpha Estate.

"We, the undersigned residents of Taviuni, understanding that you are about to leave us owing to the closing of the Alpha Estate by its owners, wish to express our sincere regret at the event. The loss the community will sustain by your departure is one which will be long felt. As a man and a friend you have always proved yourself a gentleman in whom thorough reliance could be placed and who was always ready to assist others. As a planter your energy and outspoken method of meeting all opposition to the general welfare of the community has done much to advance the colony. We deeply regret that circumstances have prevented your meeting with the success you deserved as the pioneer of coffee and tea planters of Fiji. We wish you every success in your future sphere of action and trust you will live long to enjoy it." Here followed the signatures.

The toast having been drunk with musical honours,

Mr. Stephens replied saying that he was deeply moved by the kindness of the Taviuni residents generally. His friends at North End had already entertained him, but he was completely taken unawares by another dinner at Vuna, and with the address presented to him—a thing he never for a moment could have either expected or deserved. He said his planting efforts here had been a failure, but through no fault of his own. He had done everything in his power to make a success of Alpha. He had first of all, with the late hon. J. E. Mason (a better man than whom never lived), introduced the Arabian coffee, cinchona, eardamons, and the Assam hybrid tea, and these adapted themselves to the climate and promised well until the unprocurableness of suitable labour, together with recent hurricanes in Fiji, weighed too heavily. He was very, very sorry to have to give up the fight, but more sorry than he could say to loave so many good and generous-hearted friends behind. He thanked them all heartily for the kind way in which they had entertained him and trusted that, wherever he went, he would find as pleasant and agreeable neighbours as he had in Taviuni.

A song by Mr. W. J. Ewins, "Remember Me," with words written specially for the occasion and dedicated to the guest and sung to the air of "You'll Remember Me," in good style, was followed by that gentleman proposing the toast of "The Government." He said in spite of the many hard things that are said of Crown colonies, we have many things to be thankful for. For instance, Queensland Sugar planters have been having an unpleasant time owing to the working man's vote, which has interfered with the coloured labour so necessary in a tropical climate. Our labour laws in this colony give us many advantages in working coolies and Polynesians that other colonies do not possess, and we are thereby enabled to get a fair amount of work from the labour.

Mr. Monckton, S.M., in responding, said he was given too short notice to make the reply he could have wished, but was very pleased with the views of the proposer as just delivered and he tendered thanks.

The Planting Interests were proposed by Mr. Jas. McConnell:—We are here tonight to show our respect to Mr. Stephens. He has been for a number of years a Taviuni resident. I declare that he was always

eager to advance the interests of this island. We are all patriots, but the greatest patriots of us all has been Arthur J. Stephens. I never knew him to do any act or deed that was hostile or hurtful to the interests of this Province.

There are men who I know would sell
The truth to serve the hour,
And palter with eternal God for power.

When I was in Australia lately (and here in Fiji), I always embraced every opportunity of pointing out to people with capital and sons to settle that Fiji would be in time a great colony. I havo been often grieved to hear the remarks made "that much capital had been wasted in Fiji. That a Government official, who now possesses the confidence of the Colonial Office, had at one time planted 40 acres of ramie on Taviuni and there was not then (or yot) any machine to clean or prepare it for the market." Then I have been reminded that "a large area of coconuts had been planted on the Nananas, the coconuts grew, but did not bear a remunerative crop." Because Taviuni would produce a good crop of nuts, it did not follow that Viti Levu would do so. Then we have been all reminded constantly about the capital wasted on the islands of Rambi and Mango, and at Deuba. To hear of these visionary schemes having failed and to be told (as you all have been) that Fiji was not a good country, has been to me always very painful to listen to. I have generally, in reply, said:—"Dear friend, do you not know that Fiji is a Crown Colony. You only want to send your son to Fiji. What if he blunders and waste your money; the fact of having failed and lost your money and not having been a successful colonist will secure for him recognition at the Colonial Office. He will probably be made a Governor. He will be certainly qualified for, and made a Crown Colony Legislator. The chances arethat he will be made a K.C.M.G., and may blossom into a Duke." (Cheers.) Gentlemen, the present is the most awful crisis that ever Fiji saw. During the past few years, the Mortgage and Agency Company, the New Zealand Loan and Mercantile Agency Company, and the Union Bank have withdrawn their capital, indicating that something must be rotten and decidedly wrong about the way that the affairs of this colony are administered, directed or managed, when financial institutions of the highest standing refuse to help the colony to develop the agricultural resonrces of the country. These, according to the estimate of competent men, should produce an annual return of twenty millions sterling, and just examine the beggarly show of empty boxes, and we have no parliament and a Legislative Council that is not capable (or competent) of re-arranging Colonial affairs on a solid basis. Sir, the entire colony must deplore and lament the closing up of tho Alpha Tea Estate; the labour troubles have had much to do with this movement. The fact is the Government and the Legislature about this question and other matters are not in sympathy with the colony; they are only in touch with the wants of the residents at Suva and Levuka. History is only repeating itself. Western Australia, New South Wales and Natal each was for many years in its infancy directed by the Government of a Crown Colony, with a nominee Council. Whilo so nursed tho growth of each, like Fiji, was stunted and dwarfed. The first thing that the Representative Legislative Assembly of Western Australia did was to pass a law to give 1,000,000 acres of tho waste lands to a syndicato to run a line of railway 300 miles into the interior, and open up the country for settlemont. Tho policy was very beneficial and effectual; in loss than six years the population has been doublod and within the last two years tho revenue has risen from £400,000 to over £1,200,000. Fiji has boen a Crown Colony for 20 years. I suppose, like Western Australia, the Colouial office will continue to spoon-feed and koop us in loading strings for another 20 years, unless by accident a Governor Weld or Sir Charles Mitchell be sent here, who will, do justice to the colony and explain to Downing Street that the attempt to guide tho infant stops of the colony by a Nominee Council have been unfortunate and disastrous.

You all know the history of the Roman Emperor who fiddled while his city of Rome was burning. The history of Fiji shows that the Governmet and the Council have been very much like that Emperor. They have quietly sat (either through apathy or prejudice) and watched the tea and fruit industries being wiped out. The hill land of Taviuni is the best tea land in the world; Mr. Stephens has proved it beyond a question of doubt. The cost of labour prevents the industry being worked at a profit. The Alpha Tea Estate is closed up and abandoned; other estates for the growth of tea will not be started. The Government "native tax experiment" is rosponsible for the high cost of labour and its limited supply.

The fruit industry was extinguished loug ago on the two most valuable islands of the group, covering half the lands of Fiji, Taviuni, and Vanua Levu. The fruit industry to be successful in Fiji should have been fostered and promoted on these two islands, the volcanic soil of which is pre-eminently well adapted for its growth. But not so; the clay subsoil along the coast of Viti Levu, the retentative nature of which holds the rainfall and causes the land to be what the farmers call sour; this generates diseaso in plants, the pines shipped from Suva are a miserable article, the land there will only produce one crop of bananas and they are a diseased abortion. The value of fruit for a few years after 1882 was over £10,000 shipped from Vanua Levu via Levuka. During 1893 only £281 worth; and last year there was to the value of £241 only. The centralizing policy at a distant place like Levuka on a barren islet has undoubtedly arrested the progress of Fiji. The future greatness of the colony depends upon the development and the cultivation of the soil of Taviuni and Vanua Levu.

It was during the time that Sir Charles Mitchell was here that I last brought the question of the shipping arrangements under notice of the Government. Sir Charles, having had West Indian experience, understood the question that the interests of an important island like Taviuni were not identical with that of another island at a distance of 100 miles away, and that to tranship the imports and exports of Taviuni at Levuka, Kadavu, or Norfolk Island, was not to be justified. * * *

Mr. W. J. Ewins, being called upon to respond for the Planting Interests, said Mr. McConnell had said that Viti Levu lands had no chance against such as those we possessed, but apparently the fruit and cane growers there were not of his opinion; for they were by no means beaton yet, in spite of discasos in bananas and cane, as is being evidenced by the large areas the planters were still opening up. (Applause). Speaking as a sugar-planter he felt certain, in spite of the deplorable fall in the prices of sugar, that, incredible though it may seem, by judicious economy, careful and skilful management, we could still make a profit and felt by no means. With regard to tea and coffee, it was sad to think that many who had tried these industries had not met with better success. The high cost and difficulty of procuring local labor mainly contributed to such failures. It was a pity that the Fijian was not more easily and cheaply available for such work. He spoke a short time back for the Government, but now spoke as a planter and he must say that he thought it a pity that a system of native taxation, which was based on the Dutch policy in the Malayan Archipelago, should be continued in a British colony where a similar mode to that of the Dutch is impracticable.

Hon. J. M. Borron proposing the Commercial Interest.

Mr. J. McConnell, rosponding for the Commercial Interests * * * You know that up to the present the mineral resources of the islands are an unknown quantity. They may be of great value for aught that man can tell. We have no mining class in Fiji to provide for. No manufactory of any importance has yet been started, unless you can call the Suva Desiccated Coconut Co. one. Its success is very doubtful. Manufactories might be established, and when these are attempted it will be a good thing for Fiji, if care will be taken in selecting competent

Directors. A failure of any enterpriso through want of prudenc in that direction would do harm to Fiji. The wealth of Fiji is at present derived from the fruits of the soil; therefore the success of a commercial man in Fiji depends upon the prosperity of the planters and the progress that may be made in bringing under cultivation the waste lands of the colony. These waste lands amount to over 4,500,000 acres and there are only 39,000 acres under cultivation. Be assured that the Vuna Chamber of Commerce whether it had one or fifty members, will endeavour to secure for tho planters of these two islands direct steam communication with the colonies, to enable the planters to grow and export fruit and save the planter double freight, and the intermediate charges now imposed by the middlo man for transhipping.

PERAK MILLING AND TRADING COMPANY, LIMITED.

The prospectus of the Perak Milling and Trading Company, Limited which has a capital of $12,000 has been forwarded to us :—

The Company is being formed for the purposo of purchasing from Messrs. Tait, Tate and Company of Perak, Engineering Contractors, the following properties :—1,300 acres of *padi* land in the District of Krian in the Protected Native State of Perak in the Malay Peninsula, and of three other pieces of land respectively situated in Tanjong Piandong, Kurau and Bagan Serai in the aforesaid District, and of purchasing *padi* from the Native producers thereof and milling the same. The cultivation of *padi* in the State of Perak has of late years been rapidly increasing, and the Government recognising the importance of the industry has recently started a new Irrigation Scheme for the District of Krian by means of which it is confidently expected that the production of *padi* in the next four or five years will be more than doubled. At present the cultivation of *padi* is exclusively carried on by natives. They produce annually about 6,000,000 gantangs of *padi* (a gantang being equivalent to a gallon in English measure) 4,000,000 of which are exported as *padi*, and 1,500,000 as rice which has been simply treated by hand mills.

The first mentioned property is held by Messrs. Tait, Tate and Company, under a Lease for 999 years from the Sultan of Perak. 100 acres of land have been planted with *padi* and another 100 acres will be cleared before the end of the year.

The Vendors are to receive $35,000 in cash for the cost of the erection of the Mills and for the expenses incurred in opening up and cultivating the land till the end of the current year, and ten fully paid-up shares. It is proposed that the Company should open up 250 acres of land annually, thus bringing the whole estate into cultivation in five years. It is hoped that two crops a year may be produced as is the case in Ceylon.

In regard to the planting of 13,000 acres of paddy, the estimated profit per year for the first five years is $5,000 and the estimated profit yearly after the fifth year $16,000. The total expenditure for milling is stated at $178,000 and the total receipts $208,000 showing an estimated yearly profit of $30,000 which with the average profit on the estate for the first five years shows a total profit of $35,000.

CAMPHOR IN JOHORE.

Datu Meldrum reports :—

Scarcely such a thing as Kapur Barus—*Dryobalanops Camphora* is to be found in the territory of Johore now. To obtain it involves the destruction of the tree and before a tree reaches maturity more than a generation must elapse. The price of Barus Camphor used to be twenty times higher than Japan or Formosan manufactured Camphor, *Camphora Larus.* No attempt to plant it has been made in Johore.

THE MANUFACTURE OF INDIAN CIGARS.

A PROFITABLE UNDERTAKING.

We are (says the *Madras Mail*) glad to see that the manufacture of cigars in this country under European management gives every promise of developing into a large and profitable industry. The first annual general meeting of Messrs. G. Mengel & Co., Limited, was held at Dindigul on the 28th instant, when the balance sheet was presented which showed on the ten months' working a net profit of 12½ per cent. This is very satisfactory. There is no reason that we can see why all the cheaper brands of cigars smoked in Europe and Australia should not in course of time be obtained from Southern India. Public balance-sheets, such as Messrs. Mengel & Co.'s, conclusively show that there is money in the business, and we know that enterprise is not lacking. During the first half of this year 109,292 lb. of tobacco—nearly the whole of which was in the form of cheroots—were shipped from this port as against 77,006 lb. for the same period in 1894.

LETTERS FROM JAMAICA : BY AN OLD CEYLON PLANTER.

Blue Mountains, July 31st 1895.

ORANGE CULTIVATION.

You appear to have in a gentle way, been "hauling me over the coals", in that I have not, as your Jamaica correspondent, given you more information as to the wonderful expansion of the Orange Trade and Cultivation on the North side of the Island. I was under the impression that in my first letter from Jamaica, I had dealt fully on that subject, and stated that "Pen" keeping, and "Banana" cultivation were the most paying investments in the Island. The growth of the orange trade has certainly been very remarkable. In 1884 the total value of fruit exports was £253,019 ; in 1889 it was £320,323 and in 1893-94 it had risen to £527,871. Last winter there was a terrible cold wave in Florida, and it damaged not only the crop, but the trees very severely, and those of our orange growers who had oranges left made a lot of money by shipping them, and for another year or two, until the Florida trees pick up again, there ought to be good times for our orange growers. But in Jamaica we have no orange groves proper, and the attempt to grow them on that principle does not seem to have been successful. Perhaps we want some Florida planters to come and teach us grafting and other "dodges." The best Jamaica oranges seem to be those sown broadcast by the birds, these usually come up sweet oranges, but I am told that if you plant seed most of it comes up Seville orange, so that

GRAFTING IS NEEDED

to turn it out a profitable tree. I hear one or two grafters have lately been imported, so we may do better in the future—"Experientia does it." The best oranges grow at an elevation of 2,000 to 3,000 feet above the sea—Manchester is famous for them, but they grow well all over Jamaica, and if they were picked at the proper time, and sized, and shipped carefully as Mediterranean, and St. Michael's fruit is shipped, they would certainly "take the cake" in the American markets, and there is no reason why they should not do the same in London and Liverpool. I have shipped a few boxes myself on trial to London, *early* in the season with most satisfactory results,

AS TO BANANAS

(or plantains, as we called them in Ceylon) the edict has gone forth that the trade as regards Jamaica has passed its zenith and that competition from the Central American countries, and such places as Honduras, and Boca del Toro, Cuba, nay even Colon will soon run the Jamaica exporter very hard, the more especially unless he improves the quality of his shipments, and makes them arrive at market in the "fittest condition."

OUR SETTLERS HAVE BEEN SO CARELESS

in the preparation of their products for shipment, be it Coffee, Cocoa, Bananas, Oranges, Pimento, etc. that except for mountain-grown and prepared Coffee, Jamaica obtains much lower prices for its products than would be the case, were they shipped in good order. I have seen it suggested in the papers that a law should be passed that would cause all produce to be inspected by Government officials before shipment; and that all bad and doubtful packages should be rejected and not allowed to be put on board ship. It would be a somewhat drastic measure, but it would be one to make "Quashie" sit up, and see his sins "of negligences and ignorancies." No fault can be found I believe as regards

RUM AND SUGAR,

except that if more modern machinery were universally adopted, better results would be obtained. The usine system is once more being urged upon our Sugar Proprietors, as a means of fighting Beetroot Sugar which under the subsidized system, the Cane Sugar Planter is not able to overcome. Something must ere long be done to enable our Sugar Planters all over the British Dominions to fight beet sugar and to hold their own, and it will be a most suicidal act on the part of Great Britain, if she allows her Colonies to be ruined, for the mere principle or "fad" of Free Trade. Trade to my mind is no longer *free* unless it is reciprocal, even Cobden himself were he alive would admit the present state of things is not just or equitable; and that when he started

FREE TRADE,

he believed other nations would follow England's example, and that trade would universally become *fair* trade, and not all one-sided as it is now, to the serious loss and next door to ruin of our English Farmers and Manufacturers, and our Colonial Planters and Agriculturists and Stock growers all over the Kingdom. How Ministers, whether Unionist, or Liberal, do not see the unfairness of letting subsidized articles like beet root sugar come in freely, with non-subsidized sugar, has been a puzzle to me, and proves that politics are not honest and straightforward, but simply pandering for popularity to the mob, and the rag-tag and bobtail of the constituencies. Could I become ruler of Great Britain's policy, I would have free trade with our Colonies, getting them to

PROTECT ALL BRITISH PRODUCTS

by a favourable tariff, as against foreigners. I would also only have free trade with such nations as placed no duties on British productions, and I believe if this were done, the revenue would very much increase, and the money could be devoted to the better payment of our sailors and soldiers, and to the payment of pensions to people too old to work who have lived an honest and hardworking life. This would be making really good use of the money.* We are shortly to have

A GENERAL ELECTION,

as we are to have a Member of Council for each Parish in the island, and a very sensible law has been passed to the effect that such member must be a resident in, or be a proprietor in the parish. This will keep out lawyers of whom there are already too many in the Council; and also should prevent all demagogues, and those who wish to set the black man against the white, from airing their Radical and disloyal opinions in the Council.

W. S.

P. S.—I believe you still get the *Gleaner*—I see in its columns that there is a likelihood, of Jamaica supplanting Florida and that Americans are likely to come here to start orange groves.

* In Ceylon we have had for three years "protection" of the local rice growers, and yet our imports of rice go on increasing!—ED. *T.A.*

OLD FARMERS AND MODERN AGRICULTURE.

Prof. Wiles of the Department of Agriculture, Washington, in an address on "the chemists, the farmer and the people," drew the following amusing picture in verse of the old-fashioned farmer, moralizing over modern agricultural science:—

And the fellers from the College of Agriculture, they
Wuz thick az lightning bugs in June, and had a heap to say.
There wuz one they called a chemist, and he kind a seemed to know
All that wuz in the air above and in the ground below.
He sed we needed nitergin, and showed us how the stuff
Wuz awful high and skeeree for crops, while in the air enuff
Wuz found to make us 'tarnal rich if we could only git
Some cheap and sartin projeck of hitchin' on to it.
He sed that peas and clover and other crops like them
Wuz jist the stuff to do it and store it in the stem,
And the yeerth is full of critters that eat this stuff, you see,
And change it in a twinkle into ammoniee.
Since I come back from the institoot, it really appears
That potash, nitrate, fosferus, wuz ringing in my ears.
And, William, it seems perty tuff that you and Jim and me
Hev went along so ign'rant of what we daily see.
Jist hauled manure out on the pints and plowed and hoed and mowed
And worked so hard for little pay, and never, never knowed
Thet clover, peas, and beans, and sich ez the chimist mentioned there
Hev the highly useful knack of suckin niter from the air.

INDIAN TEA SALES.

(From *William Moran & Co.'s Market Report.*)

CALCUTTA, Sept. 17th, 1895.

TEA.—The market during the last fortnight has been strong, and of the 41,000 chests brought to auction, practically all were sold. Prices have ruled very firm for all descriptions, while common grades, especially leafy sorts, show a rise of from ¼ to ½ an anna per pound.

Quality generally has been better, the most marked improvement being on teas from Assam, Dooars and Sylhet. This week's sale, being the last before the holidays, will be large, probably 33,000 chests. The following sale will be held on the 2nd October.

TEA IN CEYLON AND S. INDIA.

The *Madras Mail* of October 4th, commenting on the figures given by the *Observer* of probable future extensions of tea in Ceylon, offers some remarks of interest to local planters. Admitting that there are 60,000 acres which may be put under tea in Ceylon during the next five or six years, it asks:—

"When these 60,000 acres are in bearing, what, in all probability, will be the extent of land under tea in Ceylon? Will it be the present acreage (*i.e.*, 379,182 acres) plus 60,000? We venture to assert that it will be nothing like this Admitting that these 60,000 acres are in every way suited for tea, and are, as predicted, brought under cultivation, then, if we can attach any credence to reports which have reached us they will not do very much more than replace the acres of poor soil and miserable land opened up in recent years, which will never give an adequate return, and which will naturally fall out of cultivation little by little year by year. The fact of the matter is that tea cultivation is being overdone in Ceylon, and, we hold, foolishly so, seeing what good land is available in Southern India. Travancore is fairly well-known in the island and Ceylon planters have given their attention to it; but a district which is but little known, and which is most admirably suited for tea, is the Wynaad. This district is divided into North, South, and South-East Wynaad. It is in the South and particular parts of the South-East where, in course of time, tea will be largely cultivated. That the plant will give splendid results there is evidence to prove. The soil in this district is most fertile; the land is either forest, bamboo or old coffee that has lain fallow under scrub for a decade; the climate is very suitable; and the communications are on the whole good. Owing to the gold mines, which were at work there fifteen years ago, roads have been traced all over the district, and in many places there are deserted bungalows and the foundations of old storehouses, mills, &c. Companies in Ceylon and individual planters would do well to prospect Wynaad before putting poor land under tea. So long as the present policy of pushing the product in new markets is pursued, we do not believe that the Indian and Ceylon tea-planter, with cheap labour and the best of machinery, need have any particular dread of over-production; the world still wants 200 million lb. of tea annually more than British plantations can produce. But, should over-production ever take place, or should, for other reasons, there be a fall in prices, it will then be a survival of the fittest, and the Company or the planter who has put every rubbish-heap under cultivation simply because it happens to be near his door, and who has deliberately ignored good soil, yielding 1,000 lb. and more of tea *per* acre, owing to its being at a little distance, will bitterly see his short-sighted policy. Wynaad, in a small way, has as great a future as a tea-producing country before it as either Ceylon or Travancore, and no one, we believe, would be more ready to accept this than any Ceylon tea-planter who might hapens to visit that district.—Local "Times."

DRUG REPORT.

(From *Chemist and Druggist.*)

London, Sept. 19th.

ANNATTO-SEED—In good demand at rather firmer rates, 25 packages fair Madras realising from 3½d to 4d per oz.

CAFFEINE—The spot price in second-hand is 21s 6d to 22s per lb., but very little is available. Whiffen's brand for October delivery offers at 20s, Howard's for December at 18s per lb.

GAMBOGE—There has been an active demand for fine qualities of gamboge, mostly for America, and an advance of 10s has been established, good picked having realised 10*l* 15s per cwt. At today's auctions no demand was manifested. For Saigong and Singapore mixed, small to medium prices, partly dull ricely fracture, 9*l* 10s per cwt is the limit. For fair pipe and lump a bid of 8*l* 15s per cwt was refused.

ESSENTIAL OILS—Cinnamon-leaf oil is again dearer; 2½d per oz has been paid and 3d per oz is asked. Cinnamon-bark oil is also tending higher, a good deal of the supply having been bought up. For a lot in sale today 1s per oz was asked. The Lemon crop outlook is said to be very unsatisfactory. Oil guaranteed to contain 7·7 25 per cent of citral offers at 3s 9d to 4s per lb., c i f prompt shipment. Citronella firm; small parcels have sold at 1s 3 d per lb. For arrival there are sellers at 1s 1d per lb, c i f.

QUININE—A somewhat better tone prevails, and 20,000 oz of second-hand German bulk have changed hands at the slightly improved price of 13¼d per oz on the spot. The following are the present manufacturers' quotations:—Howard's vials 1s 4d to 1s 5d: tins 1s 3d to 1s 4d. Whiffen's vials 1s 4d; tins 1s 2d. Pelletier vials 1s 5d. Fabrica Lombarda vials 1s 4d, tins 1s 2d; German tins 1s 2d per oz. In America the consuming demand for quinine is described as excellent. All the current orders go directly to the manufacturers, dealers having generally advanced their views to 25c, although jobbing orders might possibly be filled at 21¾c in small lots. A parcel of 20,000 oz has just been shipped from New York to London by the 'Europe."

VANILLA—A moderate supply, mostly of good quality, sold at very high prices.

FRUIT IN UVA.

(*From a Correspondent.*)

Re fruit culture, for which our district is remarkable and I should say the *best climate in the Island*, I am sending you by goods train a tea basket full of lemons, citrons and bitter oranges, (Seville oranges I think I have heard them called). The two latter citrons and bitter oranges grow like weeds, everywhere along the banks of streams and are gathered, and used by the natives in their diet, curries, &c. The lemons, I have grown from imparted seeds. The fruit I send you are by no means a good sample, as my soil is very poor and the cultivation spontaneous, without any manure. Besides these I have growing apples, pears, plums and peaches, all bearing fair crops on poor patana soil without manure. The local fruit trees, I also grow, and side by side, I can show you loquats, China and native guavas, mandarin and sweet oranges of varieties, mangoes, jacks, and plantains of varieties, limes, passion fruit, granadillas, grape vines, pine apples of varieties, in fact almost any indigenous fruit can be grown here, and if your Mildura friends want to live and enjoy life by fruit culture let them come to our glorious Uva climate in prefereuce to any other place in the island or lowcountry, with its heat and malaria!

[We are obliged for the abundant sample of fruit: enough of acidity to sour even "Mark Tapley"; but Uva can produce sweet things too.—ED. *C.O.*]

COFFEE PLANTING BY JAVANESE.

Three lots of coffee land at Seluma, Perak, amounting in all to forty acres, have been applied for by Javanese. The headman has gone to Kunnning to buy seed and returning via Penang, will bring in about a hundred followers; he has had experience in coffeo planting at Klang in Selangor. If these men settle permanently, and succeed, others will soon follow; the opening up of the new bridlepath from Alor Pongsu in Krian to the Ijok river ought to help the development of this District considerably and will open up a considerable area of bendang land for settlement.—*Pinang Gazette.*

ORCHID COLLECTING IN NORTH BORNEO.

The British North Borneo authorities will issue no more orchid collecting permits for the present for Province Keppel or Kinabalu. Any person travelling or collecting orchids without a permit is liable to a fine of $500.—*S. F. Press.*

THE LOWER PULNEYS PLANTERS' ASSOCIATION.

The following is from the Annual Report of this Association :—

Labour and Crops.—Our Labour supply is good and being chiefly local we are able to avoid the heavy outstanding advances current in many planting districts. The crops last year were good and this year, in spite of the unfortunate rains we had about the time of the opening of the blossom, and the scanty rain since, will, so far as can be judged now, be fair, though not as good as last year.—*M. Mail.*

CYPRUS: ITS PRESENT AND FUTURE.

(From the *Westminster Budget*, Aug. 23.)

A TALK WITH ITS HIGH COMMISSIONER.

As Sir Walter Sendall, K.C.M.G., High Commissioner of Cyprus, had recently arrived in London, it occurred to us that he might be willing to give some information about the one British trophy of 1878. The island has so often, lately, been described as a white elephant that information about it from one, who could speak with authority, seemed likely to be generally interesting. The High Commissioner replied very courteously to the suggestion, and so a representative of the *Westminster Budget* found himself a day or two ago in pleasent *tête-á-tête* with Sir Walter Sendall not very far from Hyde Park Corner. Sir Walter at once remarked on the contrast between the climate of Cypras and England, which he felt very much, as he happened to arrive in London just after the long drought came to an end.

CYPRUS AS A HEALTH RESORT.

"And is Cyprus fairly healthy?" I asked.

"It's an extremely healthy place," said Sir Walter. "It got a bad name when we occupied it first; but for a long time it has been the healthiest station for troops on the foreign roster. There's no doubt, if we had better roads, it would be much resorted to. The few people, who have come over from Egypt, say that the change from Cairo and Alexandria is exceedingly agreeable. They come over in the summer-time, of course."

As Sir Walter has held the Governship of the Windward Isles and of Barbados, the following question naturally suggested itself to me :—

"Is the climate at all like that of the West Indies?"

"It is during the hot months. Then it is like that of the tropical West Indies. But then we are, of course, north of the Tropics, and we have a really cold winter; fires all over the house, in every room."

"And the island is otherwise attractive?"

"The scenery in the mountainous part of the island is extremely beautiful. Unfortunately, the least inviting portion of the island is the part which first catches the eye of the visitor, and that is Larnaca and the road from Larnaca to Nicosia—a flat uninteresting country. The proper name of Nicosia is Lefkosia, from the white minarets of the Turkish mosques. The place itself is picturesque enough, and I reside there during the greater part of the year; but in the summer the Government moves to Troödos on the Olympus range, where the troops are stationed.

CYPRUS AS A SEAT OF WEALTH.

"In the olden time," said I, "Cyprus was wonderfully prosperous, was it not?"

"It was not only rich," said Sir Walter, "but a seat of commerce, and abounded in wealth of every description."

"And how is it that the British occupation has, so far, failed to benefit the island?"

"Well," said Sir Walter Sendall, "the main thing, of course, is want of money to develop the resources. Then, you see, it has been for 400 years under the Turks, steadily wiped out, and prevented from every kind of progress,"

"The root of the whole matter is this," continued the High Commissioner, "that so large a proportion of the money raised by taxation leaves the island to make up the payment, which England is under an obligation to make to the Porte under the Convention, that it leaves the Government with the bare expenses of administration, without any surplus, which would enable them to embark upon any expenditure for improving the productiveness of the island. Cyprus is an improvable estate, but the Government have no money to spend on improvements."

AGRICULTURE 2,000 YEARS BEHIND THE TIMES.

"And as the Cypriotes are poor they must plod along as best they can?"

"Their methods of agriculture," went on the High Commissioner, "are of the most primitive description."

Here Sir Walter took down from the mantelshelf a tiny moded of a Cyprus plough. "There," said he "that's what they use today. It's just what Virgil describes. They haven't changed their implements of agriculture for 2,000 years. You see, it can only scratch the ground. Here again is a model of their threshing implements. Of course, with such materials, the grain must have a lot of dirt mixed up with it. As for the threshing-floors, they are precisely what they were in Palestine in the days of Araunah the Jebusite. Every village has one or more of these."

Sir Walter Sendall declined to discuss the value of Cyprus as a place of arms, though he had no doubt whatever of its great usefulness as a sanatorium. He also considered the phrase "enchanted island" as somewhat overstrained, except as coming from a person who saw the Orient here for the first time.

Tea in Ceylon and Southern India.—The Madras *Mail* in discussing our Planting Statistics for Ceylon has taken the opportunity to dilate on the great advantages presented by the Wynaad districts for intending tea planters. We have not a word to say against these advantages; but our contemporary goes too far in speaking at large of "acres of poor soil and miserable land" opened with tea in Ceylon. We have often said how India tea visitors so far back as 1885, declared after visiting our tea gardens that half-a-dozen years would see many of them snuffed out; but somehow these same gardens are now more prosperous than ever they were Our contemporary makes a mistake over our statistics—not 379,000 acres are in tea, but 305,000 on plantations (the balance being coffee, cacao, &c.,) besides, perhaps 5,000 in native gardens not enumerated—making 310,000 acres altogether under tea in Ceylon today. When 60,000 acres are added, before the close of the century, we shall have 370,000 acres and we see no reason why all this area should not be in full and prosperous cultivation by A. D. 1900.

COCONUT PALM ON FIRE.

Mr. Jardine writes:—"I never saw a coconut tree set on fire by lightning or meteorite, though I have seen hundreds killed by lightning."

Mr. W. H. Wright, writes:—

"I saw a tree some eight years ago take fire from a sky-rocket. The tree is situated at Colombo in Regent Street, the property belonging to Mr. W. Vanderstraaten, proctor. I may say that after a few months I saw the same tree giving a very large crop of nuts. I have taken this as a lesson; occasionally since, when I have found a tree not giving crop I set fire to it, so improving the tree and forcing it into crop.—Some time ago I witnessed a coconut tree taking fire from a flash of lightning and just before the rain came down; but I never saw any tree in a blaze during the rain, I suppose owing to the trees being wet and so the fire cannot ignite."

CLYDE TEA ESTATE CO., LD.

Incorporation of this Company with a capital of R300,000 divided into 3,000 shares of R100 each has been applied for by Messrs. Julius & Creasy. As has been reported the Company has purchased Clyde, Kaluganga and Liskillin estates in the Kalutara district.

MORE TEA COMPANIES.

The shares in the Ruanwella Tea Estate Company which is to have a capital of R260,000 have been privately subscribed more than twice over. Ruanwella belonged to Mrs. C. B. Deane, J. B. Lindsay and T. N. Christie, but has been sold by them to the promoters of the Company. There are 358 acres in tea out of a total of 576 acres.

We also learn that the Ederapolla and Ardross Estates, in the Kelani Valley, are being formed into a Company, with sterling capital. Messrs. Lyall Anderson Company, 16, Philpot Lane are to be Secretaries and Agents. The estates are to be taken over on 1st January. The vendors take a large proportion of the shares, and the balance was taken up at once, privately. Ardross belonged to Mr. Macmartin and has 212 acres in tea out of 294. Ederapolla belonged to Messrs. Jas. Bett and A. Watt with 395 acres tea out of 526 acres.

PROSPECTING IN CEYLON.

(By an Old Ceylon Planter.)

Three decades and more have passed away, since first I went "Prospecting" in the Central Province of Ceylon. For many years, as far as I remember, Government had not advertized in the *Gazette* any extensive forest lands for sale, suitable for the cultivation of the fragrant berry; but towards the end of the fifties, rather large blocks of land of virgin forest were advertized for sale in the Lagalla district, and I determined to have a look at them, with a view to purchase; true it was that evil reports had been circulated about Kandy to the effect that the whole of the Lagalla district was more or less exposed to violent and continuous gales at certain times of the year.

A JOURNEY BY COACH.

But "seeing is believing," and so a friend and I one fine breezy morning took our seats in the old coach, that trundled into Matale in those days daily at the rate of four miles to the hour. Two fat Tambys sat their shaky and unctuous figures in the coach, and looked as if they had been fed on ghee and olive oil all their days. Nevertheless they were mortals, and Moors seemed to enjoy the journey greatly, chatting in Tamil with each other and offering one another short cigars, which are generally called "Jaffnas" in Ceylon, and are found only in the native bazaars for sale.

The journey from Kandy to Matale town was a pleasant one, and in places the high road was shaded by over-hanging boughs, beaded with pearly tears soon to be dissolved by the growing morning. Before leaving Kandy town we had elected to leave our horses under the care of Jacob of ancient renown, as we did not wish to risk them in unknown and unroaded regions.

THE MATALE RESTHOUSE

was the spot where the coach pulled up. The hotel had a most uninviting appearance for travellers—shabby without and dingy within. The landlord, a tall, rickety-looking man, graciously informed us that breakfast was on the table, and waiting for us, visions of the inevitable estew, rose up before one,—often concocted as it was then of aged buffalo beef, swimming in a mass of half-frozen or half-melted fat of an inferior quality. It was soon off the table, and our landlord informed us that it was made from elk flesh,—but certainly it had the feel to the palate of stewed sponge! Then we had curry and rice; but alas! the *kokie* had purloined the "cream of the coconut," and left us only the saffron and aromatics. It was as harsh as a rasp and indigestible as a cucumber. Having duly blessed the *kokie*, landlord and resthouse, we mounted the sorry steeds that were waiting for us outside the front gate and left the spot. You can easily believe that

RESTHOUSE QUADRUPEDS

are not high-flyers as a rule, but the gallant grey and vicious-looking tat pony, with a coat as rough as a file and as red as rust, that waited for us were the veriest bags of bones I have ever seen offered to two fat coffee planters to ride on. The grey animal seemed as if his bony body was lifted up on stilts and Bob the tat, had a mouth so hard, that nothing but an Indian bit with points all around could hold him in when he chose to have a spree! There was no use complaining, and so I mounted upon the top of the grey, and my cheerful companion strode the Indian tat. As we thumped along the ill-paved streets of Matale town, I thought of King Richard and little John, as portrayed in my school history book long ago. And then fugitive ideas crowded my brain and I wondered if the jackals would have a meal off our fleshless nags in the Lagalla jungles. Bah! it was too ridiculous altogether. At last we passed over the new iron bridge and then hobbled into the

HAMLET OF RATOTA.

By the time we topped the East Matale coffee estates there was an aggravating sun overhead, and anon G.W.'s

FAVOURITE COFFEE ESTATES

were all before us. What a surprise they were, with the primaries of the coffee trees pruned so severely that in my native country they would have been called by the factory lads, switches. "Famous estates indeed," said my genial friend; "Why, I would not exchange my little totum for one of these hungry-looking places, and I have a shrewd guess that G.W. will bury many a British sovereign in them before he has done with them." At last we managed with difficulty to reach the last estate of the district from which we could discern the

LAGALLA RANGE OF HILLS

in the distance, and made for the bungalow of the planter that was known to have two good tats, which we hoped he would let us have for the nonce. "Come in," he said, "and take pot luck. I see you have jaded brutes under you. Come in and wet your whistles. Where are you going to?" "Oh! to the jungle lots that are for sale shortly in Lagalla?" "Well, they are over yon range of hills some half dozen miles away, but with my galloways you can mount the crest of the hills before the sun goes down and reach the only shanty in the district, where you will find an old blue-jacket, and he will only be too glad to give you lodgings for the night. Then early in the morn you start for your diggings, and I will have the ponies sent for you by breakfast time." As we reached the road over the top of the hills and returned the ponies, we entered into dense forest and following a jungle path tried to find out the new clearing where the jolly sailor lived.

COLOMBO TEA SALES: DEMAND FOR AUSTRALIA AND AMERICA.

(*From a City man,*)

London, Oct. 4.

The Planters are getting fine prices for their teas in Colombo; for some time they have been about 1d. per lb. ahead of prices here. I am glad to see the sales in Colombo increasing so rapidly; by last mail, I noticed, that about 18 million lb. had been offered at public auction from 1st January to 12th September, or more than 1-4th of the total export. In the best of the coffee days, local sales never exceeded 1-10th of the export. It is gratifying to note the rapidly increasing exports to Australia &c., it relieves the London market and does good all round. I hear the Americans strongly favor direct imports from Ceylon.

In London, prices have again advanced and a steady advance till nigh 'Xmas seems likely.

THE LABOUR QUESTION IN CEYLON.

We direct attention to a special paper printed on "The Labour Question" in pamphlet form and which the writer has given us permission to reproduce in full. Though his name cannot be given at present, we may say that the planter responsible for the views now put forth is one who travels about a great deal and has special opportunities of judging of the condition of affairs and of the remedies so far applied. In his opinion, the proposal of the Dikoya Planters' Association to ask Government to give planters a first claim on coolies' pay for advances "requires a deal of trimming." But to turn to the paper itself, the writer is greatly impressed with the helpless condition of the average cooly as regards the burden of debt he staggers under-debt which he has often incurred himself, which has been thrust upon him, and which he has more often than not inherited. It is the heaped-up responsibilities of the cooly by this last-named iniquitous process which chiefly troubles our author, and which doubtless has troubled many conscientious planters before him. For, undoubtedly it is a circumstance that has been well known to, and understood by old planters; and the file of the *Observer* in olden days teems with suggested remedies, chief of which there has lately come into favour the only remedy insisted upon by this writer, namely, *monthly payments of wages to coolies.* In order that this rule should become universal we would have it made compulsory by law. The practice of imposing debts by inheritance is bad, and should be stopped on principle; but, perhaps, somewhat too much is made of this in the pamphlet. The chief end of most coolies has been and always is the same: somehow or other to get overhead in debt, however contracted.

In insisting upon his two points the writer uses arguments and illustrations which are forcible and true, and against which very little can be said. To break the power of the Chetty and kangani over the cooly has been the theme of many planting pens, and in some few instances there are planters who have had the courage of their convictions to brave all opposition, and to carry their theory of monthly settlements into practice. Pertinently enough the writer of this brochure speaks of the experience of "a friend of his" who has "paid his coolies "every month for many years past, and has "abundantly proved the blessings of this system." On the other hand we published not long ago, one or two letters from old Managers with the deepest possible interest in their coolies, pointing out practical objections to monthly payment of coolies. One of these, a letter from Udapussilawa, excited a good deal of attention at the time. And if this question of "*Cooly indebtedness and monthly settlements*" is to be threshed out, it should be done after the manner of those other planting questions, treating in detail and the discussions collected in a concise shape—together forming a little reference library—published by the *Ceylon Observer.* Let leading planters all give their opinions and experiences, and let their letters be collected into pamphlet form for distribution and comment. It is suggested to us that this could best be done by the Committee of the Planters' Association calling for reports from the different districts. In the meantime, the "paper" we give elsewhere deserves careful consideration.

(*From a pamphlet by an experienced planter.*)

With one or two exceptions, those who have lately written and spoken about the great "Labour Question" appear to me to have dealt with the subject almost entirely from the Proprietors' and Superintendents' point of view, while the canganies and coolies have been represented to us as being for the most part demoralized, and quite different in many important respects to what they used to be in days gone by.

They are, however, in my humble judgment entitled to a great deal of sympathy, and the present may not perhaps be an inopportune time to state their case for public consideration rather more fully than has hitherto been done.

Taking our Tamil labourers as we find them in the present day, it will be admitted, that not only are they deeply involved in debt, but speaking of them generally, they are held responsible for the repayment of monies which they have only in part received, and for liabilities which they cannot, with any show of justice, and ought not, for many obvious reasons to be called upon to meet.

Dealing first of all with the indebtedness of these people, it will, I presume, be conceded that although the Coast Advance Account as shown in the Estate books is frequently a heavy one, it probably does not represent very much more than a fraction of what they are supposed to owe to the Chetties and Bazaar-keepers, to say nothing of Afghans and other creditors, and the hundred and fifty transactions running on between themselves! With the exception of the so-termed Coast Advances, all these debts carry interest, at more or less exorbitant rates, and instead of dying a natural death, as other debts frequently do, they are handed down from father to son in perpetuity. There is in fact no escape from them, and they multiply as they grow older. New coolies arriving from the Coast are taught to consider themselves part security for this accumulated debt, or bribed to do so, and children, instead of being born naked into the world, as in other parts of the globe, make their debut here with a halo of debt around them, which becomes rapidly denser as they advance in maturity.

If a Superintendent will patiently investigate the origin of any particular debt of long standing amongst his coolies, he will find in nine cases out of ten that it pertains largely to a generation of people who have long since passed away. The debt in fact has survived, while the debtors themselves have died

In too many instances these debts had their beginning at the time of the collapse of coffee, when wages were hopelessly in arrears, and frequently not paid at all, and it is a reproach to us to be reminded that at this unfortunate period, while Europeans, Chetties, and traders were chasing each other through the Bankruptcy Courts, the canganies and coolies were practically left outside in the compound. The burden of debt, though removed from others less deserving of relief, was not raised from their shoulders, and they and their children are still held liable for responsibilities incurred at that time.

The habit of inheriting and immortalizing debt is a feature in the character of the Tamils, which though praiseworthy enough in itself, has been traded on far too largely by employers of labour in Ceylon, and it is this monstrous system of extracting, or attempting to extract, from the living, the debts which rightly belong to the dead, and is largely, if not wholly, responsible for the present unsatisfactory state of affairs.

If what is involved in the above statement is denied or questioned, I would ask how it is that Estates hitherto have lost so little by Advances? If a planter of long standing is asked to name the sum he has from time to time written off his Coast Advance Account, the reply, in the vast majority of cases, indicates either that nothing at all has been lost, or at most something very trifling.

Now what is tho precise significance of this admission? and what conclusions are to be drawn from it? Either it means that the Coolies who have died in his services have departed without leaving debts behind them, or that he has contrived somehow or other (through the Cangany) to recover them from the living. We know as a matter of fact that dying Coolies are always more or less in debt, and instead of the Estate bearing the loss as it ought to do, we carry on the account from time to time, knowing that if their surviving relatives do not themselves pay the money, the sword can be held over them until the debt is liquidated from other sources. On some Estates the proportion of debt due by deceased Coolies may not amount to very much, but on others, especially in parts of the low-country, where the mortality is heavy, it represents a very large sum, and is constantly accumulating.

Of late years we have gradually come to realize that it is practically impossible to recover all outstandings from the people, who are supposed to owe the money, and it has therefore become customary and more convenient to accept payment of advances from employers of labour; but at the same time, we take very good care that the Canganies and Coolies are not relieved in any way of the responsibilities in connection therewith, and every time the debt is transferred from one estate to another, it increases in bulk, like a snow-ball, with this one distinction, that it *never* melts. Not infrequently the coolies' pay is indiscriminately and unjustly withheld, as a set-off against these outstandings, and this combined with a wicked system of irregular payment of wages due, has necessarily produced a demoralizing effect on the labour supply of the country, and one may well enquire how it could possibly be otherwise?

Sometimes, an attempt is made to draw a distinction between the kanganies and the coolies; the latter it is urged are to be sympathised with to some extent, perhaps, but as for the former, they deserve all the abuse they get, and a great deal more besides.

No doubt, many cases could be quoted to show that the kangany has defrauded his employer, especially at critical times, when opportunities have given him a chance of dictating terms; but as a general rule, it may be taken that his position is a very unhappy one. He owes far more money than he can possibly pay, and far more than he has ever received, and after all he is only a cooly, with an umbrella to protect him from the rain in place of a cumbly.

The idea that Canganies are well off and that their head money is paid them in order that they may become security for advances, is quite erroneous. The head money has nothing whatever to do with advances, and the only security which the Cangany holds for debts standing in his name is the Cooly; and what is the Cooly worth? He is possessed of two things: his cumbly and his labour! The latter no doubt is a good marketable asset, while it lasts, but it should not be mortgaged too heavily, and people who complain that Coolies do not work so well as they used to, should remember that they have very little incentive to do so; in fact, it is rather the other way on.

In olden days their debts were never more than could easily be repaid, and they moreover received every month the where-withal to meet them. In the present day their liabilities are in the majority of cases beyond reasonable prospect of liquidation, and it is no wonder therefore that they work more for Rice than for Wages. The former is served to them regularly, and they barter what they do not require for other necessaries. The latter is in a great number of cases and unknown quantity, which they may, or may not receive into their own hands, but in any case it is pretty certain to be doled out at long and uncertain intervals, and grabbed at by hungry creditors when payday arrives. So regardless have coolies become in respect to their balance-wages, that it is sometimes difficult to get them to travel from the lines to the bungalow for a settlement, and instead of expressing surprise that people so burdened with liabilities should work irregularly, and with indifference as to the future, the wonder is that under all the demoralizing influences of an unjust and ever-increasing debt, the labour arrangements of the island should continue as satisfactory as they are.

The system on which we have worked our coolies for years past, and which we are always impressing upon Government is as perfect as it well can be, encourages and fosters hereditary debts, and there is no escape from the conclusion that, if it is not directly responsible for bringing our labourers into a state of hopeless insolvency, it has at all events been closely associated with this unhappy result, and it is not very creditable to us that it should be so.

The labour difficulty of the present day is summed up in the one word "Debt." It is not that the coolies have individually changed, or that there is scarcity of them in the vineyard, but that surrounding circumstances are such as to render it difficult for us to make the most of the material at our disposal, and a state of affairs has been brought about, which shews it to be desirable that the Cooly should in future be protected to a greater extent than he has hitherto been, both from himself and from others.

Seeing that the Tamil Cooly is a pauper labour, it seems only fair and right that his debt should be buried with him when he dies, and as he has practically nothing but his labour to mortage, his debt-contracting powers should be as limited as we can make them.

At first sight it may appear almost impossible, by any means short of a miracle, to better his position as regards debt, or to bring about a more healhty state of affairs generally.

The Cooly, we know, lives in an atmosphere of debt, and likes it rather than otherwise; but while conceding all this, and a great deal more besides, there is no sufficient reason why he should be *hopelessly* in debt, and mixed up irretrievably with the debts of others, or why indeed he should be any worse off in this respect than he was twenty-five years ago. In those days Coolies were, as a rule, regularly paid, and Chetties advanced them sparingly, because the balance of wages being practically confined to one month's pay, did not represent sufficient security for a substantial loan.

If we would wish to return to these happy times, it is imperative that wages should be *promptly* and *regularly* paid, but as the debts in the country are now so overwhelming, (assumed and otherwise,) the only hope of this system being generally adopted is to make it compulsory by Legislative enactment and penal in its operation.

So long as it is optional (practically) for a Superintendent to pay his Coolies once a month, or once in three months, as tho case may be, no *general* change in the direction indicated need be looked for, but once make monthly payments *compulsory* and *penal*, and the debt-contracting power of the employed will be immediately and permanently lessened, while other very beneficial results may be expected to follow as a natural consequence.

Some years ago Lord Stanmore (then Sir Arthur Gordon) strongly urged upon the planting community the importance of monthly payments, and if he had had his way, the prompt settlement of wagos due would then have been made law; but it was pointed out to him, amongst other things, that as the Island was only just emerging from the dark days of depression into the light of better times, it might be well to postpone legislative measures in this direction until the Tea industry had thoroughly established itself in the

country, and placed people in a position to meet their engagements from month to month without personal embarrassment.

It will not be denied that our position in the present day is such as to enable us, without much inconvenience, to pay our Coolies regularly, and it is high time that they shared, to this meagre extent at all events, in the general prosperity of the island.

The principle involved in the prompt and regular settlement of wages due, is one which cannot for a moment be contested, and if circumstances, have arisen, which render it impossible to give effect to this principle ourselves, we should be grateful if Government can be induced to step in and remove the obstacles for us.

The arguments which one hears against monthly payments from a practical point of view, are that Canganies and Chetties are opposed to it, and that it might lead to a loss of outstanding advances, &c.

The Canganies object because it deprives them, to a great extent, of the power of recovering debts of doubtful origin, which we insist upon them paying, but they very soon reconcile themselves to the change and as for the Chetties and other moneylending sharks if regular monthly payments result in a loss of outstandings in that direction, we need not repine. Real and just debts should of course be paid if they can be proved, but not those which have been carried forward from time immemorial, with interest added and in this connection it must be remembered that as the influence possessed by Chetties over our labourers has never been exercised for good, we may welcome anything likely to weaken the chain which has hitherto linked them together.

The question of outstanding Coast Advances is no doubt a more serious one, but let us look at things as they are. On the majority of Estates, as already mentioned, debts have accumulated to such an extent, that they are no longer recoverable in their entirety from the people who are supposed to owe the money, but rather from *employers* of labour, and as the amount increases almost every time the account is transferred from one Estate to another, it stands to reason that before very long whether the Coolies are paid regularly every month or irregularly as at present, *losses must occur.* The sooner this is realized by proprietors and their representatives the better, and the sooner the atmosphere will be cleared of the impurities which have for such a length of time withheld from our Coolies the light of more prosperous days.

If in dealing with large advances it were customary to regard them as merely so much money paid away temporarily for the benefit the Estate derives from the coolies' labour without any intention of recovering it from the labourers themselves, the system would be relieved of much of the scandal with which it is now associated, but we know that in a great number of cases the Coolies' pay is kept in arrears, and freqnently confiscated altogether for the purpose of meeting these oustandings, and it is here where the injustice comes in; for in the majority of cases I repeat they probably do not owe very much more than a fraction of the money.

It may be asked why monthly payments should of necessity, or be likely to, lead to loss of Advances? The reason is that while coolies have no great objection to paying off debts even though they may have had little or nothing to do with contracting them, provided they can borrow money for the purpose, it is quite a different thing when they are expected to do so out of wages paid into their own hands. It is only under such circumstances that they began to realize the value of money, and pay away such as is due but nothing more.

I hardly think we shall ever see the day when Ramasami will deliberately repudiate a just debt, nor one which there is a moderate prospect of his being able to repay within a reasonable time; indeed, the tendency is all on the opposite direction.

A planting friend of mine of great experience, in charge of a large and important Estate, has paid his coolies every month for many years past, and has abundantly proved the blessings of this system, his only regret being that he cannot pay them once a fortnight. His experience is that the Coolies greatly prefer it to any system of irregular and deferred payments, and the Canganies learn to appreciate it also when they get accustomed to the change. He has no Coast Advances outstanding, and his transactions with the Chetties are few and far between.

It is HIS suggestion that a system of compulsory monthly payments throughout the Island may the means (slowly perhaps) of rostoring order where chaos now reigns, and I pass it on to the readers of this paper with every confidence that he has not overstated the benefits likely to be derived from it. Referring to the proneness of the Cooly to get into debt, he naturally enough enquires how we can expect him to keep clear of it if we withhold from him the only legitimate means of doing so?

Possibly it might be found advantageous if compulsory monthly payments became Law to avail ourselves to some extent of *Indentured Labour* under conditions which Planters and Government might mutually agree upon, but the first and most important thing is to arrange for Coolies in all parts of the Island and on every estate to receive their wages regularly, which after all, is only their just due.

In a recent Memorandum from the pen of the Chairman of the Planters' Association, reference is made to the want of touch between Coolies and their employers such as existed in older days.

No doubt this is the case to a great extent, and strage though it may seem the Medical Aid Ordinance is probably more to blame than anything else for thus alienating the Coolie from his master. Government, of course, did not contemplate such a result as this when the Ordinance was introduced; but, nevertheless, it practically had the effect of taking Coolies out of the hands of the Superintendents as regards their little ailments and so forth, and in many cases they have been left to shift pretty well for themselves ever since.

There are, however, serious responsibilities attaching to employers of labourers in a country like Ceylon, and while there may not be any very general desire to avoid these responsibilities, the tendency has been rather in that direction for some time past, and I doubt very much if the Cooly would ever have drifted into his present position if he had been properly looked after.

It has been suggested that the abolishment of the Tundu system might go some way towards solving the labour difficulties, and special legislation in respect to runaway coolies has been put forward as a possible remedy for the evil, but neither of these appear to me to touch the real seat of the disease, and the mischief associated with the former would probably disappear to a great extent if a system of regular payments applied to every estate. The Chetty would not then have the power to shift Coolies about from place to place as he has now, and even if he had the power, he would gain nothing by doing so.

I have endeavoured to shew in this paper that our Canganies and Coolies are labouring under the demoralizing influences of an unrighteous and ever-increasing debt, and that we have no right to expect any great or permanent improvement in the labour arrangements of the country until this burden has been removed from their shoulder, or, at any rate, greatly reduced in weight.

Individual planters may quote their own and other cases to prove that the conclusions which have been arrived at are wrong or overstated, but I am not dealing with individual cases. I am dealing with Coolies generally, and that their position in respect to debt is practically as I have represented it to be will not be denied. If, however, it is questioned, I would again ask how is it that Estates lose and have lost so little by advances?

Hundreds of cases might be cited to prove the great injustice of making pauper labourers of the present day pay the debts of pauper labourers who have gone before them, and it is time in our own interest, as well as on other grounds, that the immortality of these outstanding should be destroyed. Our labour system will not rest on a sound basis until this has been accomplished.

THE CEYLON IMPORT DUTY ON TEA AND SOUTH INDIAN PLANTERS.

SIR,—With reference to the enclosed circular, letter please give it attention as sent to your care carefully seeing to return to me all the accompanying papers.—I am, &c.,

A. PHILIP, Secretary.

Kandy, Oct. 19th, 1895.

(*Copy.*)

Colonial Secretary's Office, Colombo, July 23rd, 1895.

SIR,—I am desired by His Excellency the Governor to transmit to you the accompanying copy of a letter from the Secretary United Planters' Association of Southern India relative to the import levied on tea, and to ask your Association to be good enough to favour the Government with an expression of their views on this subject.—I am, sir, (Signed) H. L. CRAWFORD, for Colonial Secretary.

The Secretary, Planters' Association of Ceylon.

[COPY OF LETTER FROM THE SECRETARY, UNITED PLANTERS' ASSOCIATION OF SOUTHERN INDIA, TO HIS EXCELLENCY THE GOVERNOR OF CEYLON.]

To His Excellency Sir ARTHUR E. HAVELOCK, G.C.M.G., Governor of Ceylon.

Your Excellency,—I have the honour to address you on behalf of this Association regarding the import duty on tea, now in force in Ceylon.

I am directed to point out that whilst the tax, which has now been in force for several years, is quite unremunerative to the revenues of Your Excellency's Government, it operates very injuriously against the interests of tea properties in Southern India.

Ceylon possesses a market for teas from which all those of Southern India are shut out owing to the existence of the import duty; and this Association ventures to urge the repeal of the Act imposing this duty, not only in the interests of the planters of Southern India, but also in those of Ceylon itself.

The Association would respectfully advance the opinion that whilst no possible injury would be inflicted on the local market by the abolition of the duty, a considerable impetus would be given to the tea industries of both countries.

It is well-known that both for the London and the Colonial markets each of the teas finds a ready sale when blended; and it would be a distinct advantage to both countries if the blending could be performed in Ceylon instead of at the various Ports of sale.

I am further directed to point out that the natural market for Southern Indian Teas is Colombo; and the larger the quantity attracted thereto, the better for Ceylon.

Ceylon is in no way benefited by the exclusion of Indian Teas, as the latter is naturally absorbed at the various Ports in any case.

In conclusion, I am to ask for Your Excellency's best consideration of the prayer of the Association, and—I have, &c. (Signed) G. L. YORK, (?)Secretary.

Kandy, Aug. 19th.

To the Hon'ble, the Colonial Secretary, Colombo.

Sir,—Having duly laid your letter of the 23rd July, and the accompanying copy of a letter from the Secretary, United Planters' Association of Southern India, relative to the import duty levied on tea, before the Committee of the Planters' Association of Ceylon at a recent meeting, I have now the honour to invite your attention to the annexed copy of the resolution passed on the subject.—I am, &c., A. PHILIP, Secretary to the Planters' Association of Ceylon.

(*Resolution referred to* :—)

"That, in reply, it be stated that in the opinion of the Committee it would be highly detrimental to the interests of Ceylon Tea that the prayer of the petition from the United Planters' Association of Southern India be granted. That Ceylon has for many years worked hard to introduce her teas into foreign countries and to raise their credit for purity, and, now, that some success has been achieved, it seems unwise to admit other countries on equal terms to the jeopardy of Ceylon's interests. That, regarding the question of blending, the Committee desires again to draw the attention of Government to the Resolution on the subject transmitted to Government with the Secretary's letter of the 26th January, 1894, which Resolution, and connected statement, the Committee again fully endorses."

Colonial Secretary's Office, Colombo, 29th August, 1895.

Sir,—In acknowledging the receipt of your letter of the 19th August, 1895, relative to the Import Duty levied on tea, I am directed to inform you that the proposals contained in the resolution transmitted with your letter of the 26th January, 1894, to which you draw my attention, as offering a protection against the dangers of removing the import duty on tea, did not seem practicable for any action of the Colonial Government, under the Merchandise Marks Ordinance of Ceylon, inasmuch as its provisions apply only to any false trade description as to the place or country in which any goods were made or produced, and to the material of which any goods are composed, and has no operation at home where the fraud would be committed.

2. It would, therefore, apparently be for exporters of blended and unblended tea to adopt Trade Marks to seek protection from any fraud in blending in Ceylon by means of registration under the Imperial Act and of vigilance in the markets of Europe and elsewhere.

3. I am to say, however, that any detailed suggestions by which the local Government could apply the provisions of this Ordinance, in order to carry out the proposal effectively, will receive attentive consideration, with a view, if possible, of meeting the wishes of the United Planters' Association of Southern India, an object which the Governor believes that your Association would desire to attain.—I am, &c., (Signed) H. L. CRAWFORD, for Colonial Secy.

The Secretary Planters' Association of Ceylon, Kandy.

Sept. 23rd, 1895.

The Hon. Colonial Secretary, Colombo.

Sir,—Your letter of the 29th August to the Secretary having been forwarded to me for my perusal, I deem the matter of so much importance that I reply to it, merely stating at the same time that your letter and copy of this reply shall be laid before the next Committee meeting of the Association.

2. I have the honour to point out that while the Association in no way desires to actively injure the interests of the planters of South India, yet it in no way sees that the planters of South India have any claim for favourable consideration at the expense of Ceylon planters. The Planting Community of Ceylon and unquestionably also the Mercantile Community, are of opinion that the removal of the Import Duty on tea would be injurious to the interests of the Ceylon tea enterprise.

3. The desire of the Ceylon Planting and Mercantile Communities is that the duty may not be removed or changed in any way, because while acting as in some measure a protection against South Indian tea being re-exported as Ceylon tea it in no way hinders South Indian planters selling their produce in the Colombo market in bond. This is in fact is now done, and the statement made by the United Planters' Association that their teas are *shut out* is therefore inaccurate.

4. As regards blending, the Association is unable to see that it is in any way conducive to the interests of Ceylon tea to facilitate further than at present the opportunities for blending. But if further facilities are given, the Association is of opinion that absolute precaution should be taken that no blended tea can *possibly* be exported as Ceylon tea. Unless that object can be fully attained, the Association, I feel sure, would desire that further facilities should not be given.

5. Owing to the tenor of the third paragraph of your letter under reply, I venture to hope that the Government of Ceylon will, so far as it legitimately

may, in the first place guard and protect that industry which is its chief source of prosperity, and I regret to see that apparently His Excellency has misunderstood the desire of the Association as regards the request of the United Planters' Association of South India. It was the feeling of the Committee who passed the resolutions contained in the Secretary's letter of the 19th instant, that the requests of the Indian Association should not be granted both as regards the removal of the impost and the granting of further facilities for blending unless the Ceylon Government can make such arrangements for blending as shall absolutely prohibit the risk of fraud, and unless all expenses of such arrangements be borne by importers and there be no risk of loss or damage to the Ceylon tea enterprise. In claiming this consideration I feel confident I am not claiming more than is due from any Government towards the chief industry of the country.

6.—In consideration, I would press also that the Planting Community of Ceylon have for years now been spending time, labour and money in pushing their teas as *Ceylon* teas throughout the world, South India having done nothing to push her own teas, and any admission of South Indian teas to Ceylon without absolute safeguards that such shall not be re-exported as *Ceylon* teas would be a distinct injustice and injury to the Ceylon Planting Community. I therefore trust that His Excellency will not grant the requests of the United Planters' Association of South India.—I am, &c., (Signed) A. MELVILLE WHITE, Chairman, C. P. A.

Colonial Secretary's Office, Colombo, September 30th, 1895.

Sir,—Having laid before the Governor your letter of the 23rd of September, 1895, relative to the import duty levied on tea, I am desired by His Excellency to state that the planters of Ceylon may rest assured that the Government will do everything to protect their interests. It is not, however, politic to withhold friendly and neighbourly consideration to a proposal emanating from a country from which the planters draw their labour supply, and whose competition, if fairly and properly conducted, they should not fear.—I am, &c., (Signed) H. L. CRAWFORD, for Colonial Secretary.

The Chairman, Planters' Association of Ceylon.

Relugas, Madulkelle, October 1st, 1895.

The Hon. Colonial Secretary, Colombo.

Sir,—I have the honour to acknowledge receipt of your letter of the 30th of September, and in reply desire to thank His Excellency the Governor for the assurance that the Government will do everything to protect tho interest of Ceylon planters.

2. A meeting of the Committee of the Planters' Association has been called for the 11th instant, at which the correspondence will be considered, and until then, further reply on my part seems unnecessary.—I am, &c., (Signed) A MELVILLE WHITE, Chairman, C. P. A.

KANDY, October 19th, 1895.

To the Hon. the Colonial-Secretary, Colombo.

Sir,—Having duly submitted to the Committee of the Planters' Association at a recent meeting the correspondence that has passed on the subject of the Import Duty levied on tea, I have now the honour to annex, for the information of Government, copy of the Resolution passed thereon.—I am, &c., A. PHILIP, Secretary to the Planters' Association of Ceylon.

(*Resolution referred to*:)

"That the Committee approves of the Chairman's letters to Government on the subject, and that a copy of this resolution be forwarded to Government."

THE LABOUR QUESTION.—An estate proprietor of long experience writes:—"I am against legislation that may tell in the wrong direction in times of adversity! However, it is a question that is in the air, and has to come forward for discussion."

ARTESIAN WELL BORING IN CEYLON; AND THE NEED OF A GEOLOGICAL SURVEY.

We are asked if the apparent total failure to obtain water by artesian boring at Mannar does not furnish strong additional proof of the necessity for a thorough geological survey of the Island. We are unaware of the data upon which it was concluded that the strata in and about Mannar island afforded prospect of success to the work undertaken and now abandoned as being fruitless. We are not disposed to cavil at the expenditure, even if it were only for the sake of experimentalizing. Mannar, like many other localities in Ceylon, has a very deficient water supply, and had the work undertaken there increased that supply, it would not only have been of local use, but would probably have afforded experience that could have been beneficially extended. Ordinarily, wherever artesian boring has been undertaken, it has been upon knowledge previously obtained as to the lay of the surrounding strata and the probability of that to be pierced, confining a supply of the precious element. We are unaware if any such previous knowledge had been obtained in the case of Mannar; but, indeed, we do not see how such knowledge could have been obtained unless it were derived from a survey of the geological features over a wide area. There has long existed a tradition—which has never been in the least degree verified—that the water of the Jaffna Peninsula is derived from the Pulney Hills in Southern India. It is upon this tradition that the extraordinary diurnal movement of the water in the celebrated well at Pootoor in that peninsula has been accounted for. Probably, it was the impossibility of assigning any local cause for such motion that gave rise to the tradition. And it must be admitted that, to a certain extent, the conjecture is not wholly colourless. The intermittence of the rise and fall of the tides in this well, which does not at all agree with the action of the tides on the adjacent coasts, seems to point to some distinct operating influence. How far similar phenomena may have been observed in the shallow wells about Mannar we have no knowledge. If such are known, and it has been ascertained that they have no correspondence with marine tides, we should hold that there were *prima facie* grounds for the hopes upon which the late artesian boring was undertaken. We should be glad to be enlightened as to this matter. Failing any such solution, we can scarcely comprehend why anticipations of success were entertained.

But certainly our querist is right in his conclusion that the failure of an experiment which, had it proved successful, might have conduced greatly towards an improved water supply in many thirsty districts of this island, affords a strong additional argument in favour of a Geological survey. Until this Survey be completed, and it be, moreover, connected with that of India, all efforts towards securing, among other things, the advantages of an extensive water supply in our driest districts, must be mere "leaps in the dark." It is not necessary that we should recapitulate our previous arguments in favour of such a survey. We content ourselves with adding this additional one to those we have on previous occasions set forth. And we hope that such a scheme may be favourably considered by our new Governor when he has sufficient acquaintance with the island to enable him to correctly estimate the value of a Geological Survey in a variety of directions, more especially in respect of our plumbago mining and gemming industries, apart from the question of artesian well boring.

VARIOUS PLANTING NOTES.

SEASON REPORTS.—The Season Reports for the past month are published in the last *Gazette*. The reports regarding paddy crops and harvest are generally fair; the Southern Province reports several districts where fever, chicken-pox, measles and dysentery prevail; hoof disease in cattle is reported to be increasing in the Eastern Province, and cattle murrain in the Anuradhapura district.

CACAO IN THE DUMBERA VALLEY.—What is this we hear from a Colombo dealer, of cacao being uprooted on a well-known Dumbera plantation in favour of tea? Tea is said to grow and flush at a marvellous rate in the old rich valley. Another authority hints that coconuts, rather than tea, are likely to supersede the chocolate plant in certain divisions. We are very sorry to think there should be any circumscribing of the area under cacao.

THE IMPORT DUTY ON TEA IN CEYLON.—The Import duty on Teas in Ceylon is certainly unfair to India—says the *Madras Times*—and if it cannot be removed it should certainly be counteracted by a similar import duty in India. As Mr. Acworth says, the Ceylon duty is about 50 *per cent ad valorem*, while the Indian is only 5 per cent. In respect to tea duties, at any rate, Ceylon is considerably behind the age. Its trade is quite strong enough to dispense with a *protective* duty of 50 per cent, and if the duty is not protective, it must be useless.

COCONUTS AND LIGHTNING.—"Of course," writes a correspondent,—"lightning, as you suggest, would be a sufficient explanation of a coconut tree on fire. Was it not witnessed in a garden near Christ Church, last year or the year before, about the time of that terrible storm on Galle Face when a horsekeeper was struck dead? But in Pondicherry a storm is not suggested. Indeed, I gather that it is its absence which suggested spontaneous combustion."—There is such a thing as a bolt out of a blue sky; but, of course, it should be observed: what is the experience of Messrs. Lamont, Wright and Jardine?

"HOW TO SUPPLEMENT TEA WITH COFFEE"—is the title of a series of articles in the *Indian Planters' Gazette* evidently for the benefit of North Indian tea planters. We wonder if the writer ever heard of the late Mr. Charles Anderson's experience with 50 acres of coffee in Assam? If not, he had better enquire. Mr. Anderson (an old tea-planter) failing to persuade Ceylon (Dikoya and Maskeliya) planters in the late seventies to go in for "tea" (as they ought to have done and made a fortune 20 years ago), was persuaded by them rather to go in for coffee in Assam, with of course disastrous results.

CROWN LANDS SOLD.—Governor Havelock has sold a less area of Crown lands than any previous Governor of Ceylon during the past forty years. Sir Henry Ward (1855-60) sold 112,000 acres for about £200,000; Sir Chas. MacCarthy and General O'Brien (1861-65) 157,000 acres for £307,117; Sir Hercules Robinson (1866-71) 227,000 acres for £341,562; Sir Wm. Gregory (1872-77) 270,000 acres for no less than £612,000!—the maximum in extent and amount though not in average per acre; Sir James Longden (1878 to 1883) sold 149,000 acres for £375,000; Sir Arthur Gordon (1884-89) sold 115,000 acres for £218,000; while Sir Arthur Havelock sold (1890-95) 70,500 acres for £182,000—(highest average £2 11s 7½d per acre)—or if 1895 be fully added, in perhaps about 78,000 acres and £200,000. Although in the 40 years over 1,100,000 acres have realized over 2¼ million pounds sterling going by the old currency throughout—or an average of over R20 an acre.

ON THE MOVE.—Mr. Maguire of Messrs. Davidson & Co., proceeds on a visit to Assam this week. His itinerary will be through the tea districts there, and he will, probably, return before the end of the year.

SALE OF AN ESTATE.—Mr. J. B. Lindsay, of Ruanwella, says a contemporary, has almost completed negotiations for the purchase of Rothes estate, Dikoya, the property of the late Mr. Arbuthnot Smith. It consists of 100 acres, of which 5 are planted in tea.

A QUININE FACTORY IN JAVA—so long talked of, is really *un fait accompli* at lost. It is situated near Bandoeng, is under the control of four partners and is not at first to buy bark, but to manufacture at a fixed charge for planters. That charge is to be about 5*s* per lb. of quinine which ought to pay the producer very well if the quinine is worth 16*s* or over per lb. Further particulars will be found in another column.

TEA TO MANCHESTER.—Those responsible for the first direct cargo of Indian and Ceylon tea to Manchester are rather proud of the success attending the experiment. The tea has arrived, been discharged, and sold within fifty-eight hours. The importers congratulate themselves upon making a study of the market, for did they not send out samples in sealed bottles of the drinking water of Manchester to Calcutta and Colombo in order to see which teas were best suited to the Manchester market.

COFFEE CROP PROSPECTS IN COORG—we learn, are better than they were last year. Mr. R. Tatham writes from Tellicherry:—"We have had a good average monsoon, always a dreary time on the coast. I have gauged at our mills 111·41 inches from 1st June to date; it is all over now." Mr. Tatham was about to start on his usual visit prior to crop. Another old Colombo resident, Mr. Noone is referred to, as well and busy.

A NEW TEA COMPANY.—The prospectus is issued of the British Darjeeling Tea Company, Limited, with a capital of £50,000 in £1 shares. The company is formed for the purpose of acquiring and working the freehold tea estates known as West Darjeeling Nigali, and Pusumbing situated in the district of Darjeeling, in the province of Bengal, India. The price to be paid for the properties is as follows: West Darjeeling and Pusumbing, R7,10,000, or £39,197 18s 4d; Nigali, £6,000 in fully paid-up shares. The present issue is of 29,000 shares and £25,000 in six per cent debentures. The directors of the company are: R. J. Boyle, Esq., chairman Moabund Tea Company, Limited; W. F. Raban, Esq., director Moabund Tea Company, Limited; Sydney Thompson, Esq.; and Loftus R. Tottenham, Esq., late Judge of High Court Calcutta.—*H. and C. Mail.*

PLANTING between Chilaw and Puttalam is chiefly confined to coconuts, but we believe experiments are being made with cacao and Liberian coffee. The region is a rather dry one and a contemporary's correspondent only shews 1·92 inch of rain from 1st July to date; but in the Rajakadaluwa division especially, the soil is never too dry and the roots of the palms seem to find all the moisture they require not far from the surface. The rainfall return is, however, for Mr. C. A. Seton's Segersta estate 18 miles North of Chilaw, 12 North of Rajakadaluwa and 14 South of Puttalam. It is very satisfactory to find European capitalists pioneering in this fashion in remote and comparatively untouched parts of the lowcountry. Mr. Seton in the Puttalam district is balanced by Mr. Pole-Carew's enterprise in palms, cacao, &c., in the equally dry and remote district, Hambantota. May both be very successful.

NEW TEA ESTATES COMPANIES.—We learn that the valuable tea properties—Chrystler's Farm, Dimbula, and Glenorchy, New Galway—connected with the estate of the late Mr. John Martin are to be formed into a Limited Company for which Messrs. Lewis Brown & Co. will be the local agents, and Messrs. Lyall Anderson & Co. the London Agents and Secretaries. The shares will probably be taken up by the heirs and others interested. A Company with such fine properties should have a good name, let us suggest: "THE HIGHLANDS TEA ESTATES CO. OF CEYLON"!—Another first-class Company will be "THE NUWARA ELIYA DISTRICT TEA CO."—to include Tommagong and Concordia estates, both purchased by Mr. Megginson for this Company at handsome prices.—A third Company on the tapis is said to be "THE RUANWELLA ESTATES CO."

AUSTRALIAN TIMBER.—It has for years been a pleasant duty to record any endeavour to popularise the use of Australian wood in this country, whether for paving or upholstering purposes. Gradually the Eucalyptus and other large timber trees have become popularly known, if not as popularly used. Today our vehicular traffic is carried on over roads constructed of wood from the Antipodes, and promise is not wanting that New Zealand and Australian timbers will soon obtain higher rank. The Manchester Ship Canal Company, we believe, are endeavouring to make a market here for the wood noticed; they have brought, and continue to bring, to Manchester what may be looked upon as pioneer cargos for that section of the industrial world. The venture, we have been informed, has so far been successful, and there is no doubt that, when the capacity of the Eucalyptus is better known, it will enter in successful competition with most kinds of timber now on the market.—*Gardeners' Chronicle.*

LABOUR CASES IN COURT AND OUR LABOUR LAWS—are evidently going to attract a good deal of attention as an appeal case elsewhere indicates. This magistrate who succeeds Mr. Northmore in his responsible post must certainly be one well up to his work under the Labour Ordinance. In this connection we direct attention to the notice of motion given by Mr. Robinson for the next meeting of the Passara Association. We know there is a strong feeling rising all over the country and especially among Visiting Agents in favour of "monthly payments." One old planter writing on the subject says:—

"It strikes really at the power at present in the hands of the chetties and kanganies."

And there are many more thoughtful men who consider that to make monthly payments compulsory will be of the greatest benefit both to planters and coolies.

A COCONUT TREE ON FIRE.—With reference to the paragraph in a late *Observer*, a planting correspondent writes:—"Can the explanation of spontaneous combustion stand, in the case of a healthy coconut tree, with a large head and full crop of fruits, which is found to be on fire? I mean is it likely on scientific grounds. Is it not more likely that the head of the tree was set on fire by a meteorite dropping between the branches which are enswathed in an inflammable fibrous substance? I have known healthy trees snuffed out by the decay of the unopened leaf, but maintaining their vitality until the leaves die out one by one downwards; and I have never been able to detect any disease or insect pest. But, *per contra*, I have never seen a tree aflame, though I have accepted the Sinhalese explanation of *tharuka*, or meteorite, as the cause of the insidious defunction. Is it scientific." What about lightning setting the palm on fire?

THE SAMBUR: FROM A PLANTER'S POINT OF VIEW.—If you cut a deep ditch and put a 4 ft. fence all round your garden, he will jump it. Even barbed wire will not stop him, for he will squeeze through somehow and leave some of his back hair on the barb for you to see in the morning. No young plant seems to be safe from his devastations. He treats my blue gums the same as he does my cinchonas, and he eats up the young shoots of pommeloes, citrons, mangoes and other trees when he gets a chance. Neither will we leave *Grevillea Robusta*, or coffee alone. Tea he tramples upon and breaks the branches of the plants. A young plantation is evidently his favourite playground, where high jinks appear to be carried on during the night time.—*Planting Opinion.*

HONOUR TO AN EX-CEYLON PLANTER IN FIJI.—Elsewhere will be found very interesting proceedings from the *Fiji Times*, in connection with a farewell dinner to Mr. A.J. Stephens—eldest son of the Patriarch of Dolosbage—and himself well and favourably known here. We take over a great deal more of the proceedings than we usually do in such cases, because the several speeches reveal to us the present condition and prospects of planting in the Fiji islands far better than even a special report would. Perhaps after-dinner speeches—*in vino veritas*—have to be credited with this result; but the whole proceedings afford very interesting reading especially to Mr. Stephens' many planting friends in Ceylon.

THE DAVIDSON-MAGUIRE TEA PACKER.—Messrs. Davidson and Co., of Belfast, have always shown enterprise in advertising, and they occupy with their announcements several additional pages in the *Home & Colonial Mail* of September 27th. In addition to this, the journal itself has a two-page illustrated article descriptive of the advantages of Davidson's Improved Patent Electric Portable (Davidson-Maguire) Tea Packer, for use in London tea warehouses. Mr. Davidson, in December last, exhibited his tea packer as then arranged, but now it has appeared in a portable form—no longer bolted to the floor of the warehouse, but capable of being easily moved all over it—and worked with an electric motor. It is considered possible that this new design will eventually supersede the present highly objectionable and destructive process of "treading in," when the refilling of chests in the London bonded warehouses is necessary. The writer describes the *modus operandi* of this crude process as follows:—

A layer of about 6 in. or 8 in. deep of tea is thrown into the chest at a time, and shaken down lightly by hand. A piece of cloth is thrown over the tea, upon which the typical dock labourer then mounts, and with his heavy hob-nailed boots crunches the tea down as hard as he can, first with one foot and then the other. Naturally the haviest man gets it crushed down soonest; but what, may we ask, are the rusults to the tea? Something to make any planter or estate proprietor sick at heart, after all the trouble and care that has been taken in the assortment of his teas into true unmixed grades, free from broken and dust, for this "treading in" process when applied to any well-sorted whole leaf tea so breaks it up that, if one of the chests was afterwards re-sorted, it would likely show from ten to fifteen per cent of broken leaf or dust, and for this result the tea estate proprietor (to add to his sickness of heart) has to pay 2s 6d to 3s 6d per chest according to the size of the package.

The new arrangement is considered so thorough in its working that, when the packing on the estate has been done by its means, re-bulking in London should be quite unnessary. Consequently the suggestion is made that all the chests of machine-packed invoices should be branded in small but distinguishable letters with a hot iron (an instrument for which purpose Mr. Davidson would very likely supply along with his packets) as "Factory Bulked and Machine Packed," as on arrival in London this brand would soon be recognised amongst buyers as a "good character" mark.—Local "Times."

COFFEE PLANTING IN NYASSALAND:

Summary of Meteorological Observations at Lauderdale, S.W. of Mlanj.

LAT. 15° 57′ 30″; LONG. 35° 30′.—6 Months January to June 1895.

Months.		Year.	Mean Max. and Min.	Maxima: Mean Max.	Maxima: Extreme Min. [sic]	Minima: Mean Max [sic]	Minima: Extreme Min.	Dry 6 a.m.	Bulb 2 p.m.	Thermometer 9 p.m.	Wet 6 a.m.	Bulb 2 p.m.	Thermometer 9 p.m
January	......	1805	72·415	78·74	85·8	66·09	60·0	67·26	75·89	70·70	64·73	72·07	68·23
February	......	do	74 790	81 40	87 0	68 18	63 3	69 16	77 72	71 38	66 40	73 50	68 82
March	......	do	71 960	78 23	83 0	65 69	63 1	66 49	76 43	70 13	64 06	71 88	67 58
April	......	do	69 620	76 37	80 8	62 87	58 0	63 33	74 28	67 85	60 68	69 02	64 65
May	......	do	66 695	73 29	82 3	60 10	55 0	61 26	71 56	65 14	58 42	66 74	61 69
June	......	do	63 050	69 04	73 4	57 06	54 1	57 81	67 43	61 14	54 17	61 81	57 43
6 Months Totals..			418 53	457 07	492 3	379 90	353 5	385 31	443 31	406 34	368 46	415 02	388 40
January to June '95 Means..			60 76	76 18	82 1	63 33	58 9	64 22	73 89	67 72	61 41	69 17	64 73
6 Months Totals..			435 26	495 70	543 7	374 82	346 0	383 40	472 87	440 70	366 08	414 38	398 31
July to Dec. '94 Means..			72 54	82 62	90 6	62 47	57 7	63 90	78 81	73 45	61 01	69 06	66 39
12 Months Totals..			853 79	052 77	1036 0	754 81	699 0	768 71	916 18	847 04	734 54	829 40	786 71
July '94 to June '95 Means..			71 15	79 40	86 3	62 90	58 3	64 06	76 35	70 59	61 21	69 12	66 56

Difference 6 a.m.	Wet 2 p.m	Dry 9 p.m.	Rainfall. Totals.	Days Rain.	Date.	Largest Fall.	Wind. 6 a.m.	2 p.m.	9 p.m.	Aneroid. 6 a.m.	2 p.m.	9 p.m.	CLOUD. Cloud General. 8 a.m.	2 p.m.	9 p.m.	In "Crater." 6 a.m.	2 p.m.	9 p.m	On "Chiperane." 6 a.m.	2 p.m.	9 p.m.
2·53	3·82	2·47	38·34	31	15th	12·41	0·45	0·98	0·80	27·177	27·112	27·162	7·1	8·4	7·0	3·0	2·7	1·1	...	...	...
2 76	4 22	2 56	16 30	27	25th	4 35	0 54	0 95	0 63	177	135	175	6 8	9 1	7 0	2 2	3 0	3 2	...	...	...
2 43	4 60	2 55	13 07	26	2nd	1 74	0 70	0 76	0 72	219	186	220	5 0	7 8	5 4	1 9	3 9	3 3	...	...	...
2 65	5 26	3 20	13 79	20	25th	3 02	0 52	0 52	0 77	267	232	286	4 5	6 5	5 0	2 2	2 9	3 2	...	...	...
2 84	4 82	3 45	6 18	15	25th	1 77	0 60	0 64	0 66	335	312	345	4 3	6 7	4 1	1 5	1 8	1 6	5 8	3 2	4 0
3 64	5 57	3 71	4 37	18	7th	1 93	0 98	0 76	0 66	391	382	413	4 0	6 8	5 4	2 1	1 8	2 2	4 8	2 7	5 8
16 85	28 29	17 94	92 05	137		25 22	3 79	4 61	4 24	1 566	1 359	1 601	31 7	44 8	33 9	12 9	16 1	14 6	10 6	5 9	9 8
2 81	4 72	2 99	15 34	23		4 20	0 63	0 77	0 71	27 261	27 227	27 267	5 3	7 5	5 7	2 2	2 7	2 4	5 3	3 0	4 6
17 32	58 49	42 39	35 85	64		12 06	3 41	6 40	4 95	27 183	..		18 20	30 32	28 43	6 24	4 67	6 75		...	...
2 89	9 75	7 06	5 98	10		2 01	0 57	1 07	0 83	..	..		3 05	5 05	4 77	1 03	0 74	1 12	...	...	...
34 17	86 78	60 33	127 90	201		37 28	7 20	11 01	9 19	..	..	...	50 0	75 1	62 5	19 8	20 6	21 3	..		..
2 85	7 23	5 03	10 66	17		3 11	0 60	0 92	0 77	..		...	4 2	6 3	5 2	1 7	1 7	1 8	...	...	...

Months.		Year.	Mean of Max. and Min.	Maxima. Mean Max.	Maxima. Extreme Max.	Minima. Mean Min.	Minima. Extreme Min.	Dry bulb thermometer: 6 a.m.	Noon.	6 p.m.	Wet bulb thermometer: 6 a.m.	Noon.	6 p.m.
July	......	1893	.	73·00	...	60·29	..	54·25	68·87	61·00	53·75	63·75	59·15
August	......	do	69·845	79 40	85 0	64 45	54·0	60 40	75 60	68 50	58 46	68 30	63 89
September	......	do	75 115	85 78	91 5	66 28	58 0	66 46	82 09	74 45	61 85	69 79	65 84
October	.....	do	75 580	84 88	93 5	68 87	60 0	68 02	81 31	76 39	64 16	68 09	68 15
November	......	do	79 580	90 29	94 8	68 63	61 0	71 48	85 40	79 91	67 21	73 19	69 33
December	......	do	77 030	87 23	96 0	...	66 5	70 70	80 91	75 72	68 82	74 10	71 39
6 Months Total			378 050	500 58	460 8	328 52	299 5	391 31	474 18	435 97	374 25	417 22	397 75
July to Dec. '94 Means ..			75 610	83 43	92 2	65 70	59 9	65 22	79 03	72 66	62 37	69 54	66 29
January	......	1894	74 235	81 19	88 8	67 28	64 2	69 16	77 02	74 31	67 60	73 56	71 62
February	......	do	74 000	81 70	85 8	68 10	64 2	69 47	78 36	74 26	68 98	74 70	72 22
March	......	do	72 775	78 74	83 8	66 81	63 5	68 27	76 24	72 87	67 83	73 00	71 19
April	......	do	69 320	75 64	84 9	63 00	58 5	64 37	72 88	69 64	63 32	69 38	67 79
May	......	do	66 350	73 30	81 2	59 40	54 0	60 59	60 02	66 28	59 62	65 90	63 85
June	......	do	63 660	71 25	75 1	56 07	52 1	57 17	68 31	63 75	55 29	62 15	59 85
6 Months..			421 240	461 82	499 6	380 66	356 5	388 97	442 73	421 11	382 64	418 78	406 52
January to June '94..			70 207	76 97	83 3	63 44	50 4	64 93	73 79	70 10	63 77	69 80	67 75
12 Months July '93 to June '94	Totals ..		709 250	962 40	960 4	709 18	656 0	780 88	916 91	857 08	756 89	836 00	804 27
	Means ..		72 663	80 20	87 31	64 47	59 64	65 07	76 41	71 42	63 07	60 67	67 02
July	...	1804	64 53	72 64	79 7	56 42	51 7	57 42	70 35	64 09	55 81	63 81	60 33
August	......	do	68 23	77 05	84 5	59 42	53 8	59 36	73 38	66 88	57 02	64 62	62 65
September	......	do	70 69	82 22	90 3	59 16	53 0	61 28	77 98	72 07	57 51	67 46	63 67
October	......	do	79 03	92 46	100 1	65 60	60 5	67 77	87 94	80 97	62 90	73 93	69 55
November	......	do	78 95	89 57	97 4	68 32	65 0	69 84	85 57	81 24	66 46	72 71	70 94
December	......	do	73 83	81 76	91 7	65 90	62 0	67 73	77 65	75 45	66 38	71 85	71 17
6 Months Totals			435 26	495 70	543 7	374 82	346 0	383 40	472 87	440 70	366 08	414 38	398 31
July to Dec. 94' Means...			72 54	82 62	90 6	62 47	57 7	63 90	78 81	73 45	61 01	69 06	66 39

Difference 6 a.m.	Wet Noon.	Dry 6 p.m.	Rainfall. Totals.	Days Rain.	Date.	Largest Fall.	Wind. 6 a.m.	Noon.	6 p.m.	Aneroid. 6 a.m.	Noon.	6 p.m.	Months.	Year.	Cloud. 6 a.m.	Noon.	6 p.m.	Crater. 6 a.m.	Noon.	6 p.m.
0·50	5·12	1·25	7·17	15	11th	3·75	..	...	—	..	..	—	July	'93	...	..	...	...	—	..
1 94	7 30	5 21	0 24	3	2nd	0 23	—	—	..	...	—	—	Aug.	do	...	..	...	...	...	..
4 61	12 30	8 61	0 50	2	15th	0 43	...	...	..	..	—	..	Sept.	do	...	..	...	...	..	..
3 86	13 22	8 24	1 92	7	9th	0 91	..	..	..	27 535	..	..	Oct.	do	...	..	...	...	..	—
4 27	12 21	10 58	2 77	9	11th	1 76	0 36	1 00	1 00	526	27 578	27 464	Nov.	do	2 45	5 33	4 00	...	..	..
1 88	6 81	4 33	10 20	26	9th	1 98	0 22	0 05	0 65	481	477	447	Dec.	do	7 78	6 97	7 68	..	..	..
17 06	56 96	38 22	22 80	62		9 06	0 58	1 05	1 65	1 542	1 055	0 911			10 23	12 30	11 68	...	...	..
2 84	9 49	6 37	3 80	103		1 51	0 29	0 52	0 82	27 514	27 527	27 455			5 11	6 15	5 84	..	...	...
1 56	3 46	2 69	19 10	28	13th	3 31	0 23	2 08	1.00	27 460	27 460	27 430	Jan.	'94	7 06	8 20	7 71	...	MS. undecipherable.	MS. undecipherable
0 49	3 56	2 04	16 21	26	7th	2 95	0 31	1 00	0 66	476	470	440	Feb.	do	6 69	7 82	7 64	...		
0 44	3 24	1 68	14 89	28	18th	2 40	0 10	0 65	0 65	476	471	463	Mar.	do	8 00	7 50	8 00	...		
1 05	3 60	1 85	13 95	25	10th	4 35	0 78	0 75	0 51	575	568	554	April	do	5 04	7 36	7 16	2 74		
0 97	3 93	2 43	3 56	18	22nd	1 87	0 85	1 40	0 72	632	636	615	May	do	4 30	6 10	4 97	1 60		
2 42	6 16	3 90	0 77	12	27th	0 39	0 31	0 86	0 44	678	718	688	June	do	3 60	6 60	5 70	0 68		
6 93	23 95	14 59	68 58	137		15 27	2 58	6 74	3 98	3 297	3 323	3 190			34 69	43 58	41 18	5 02		
1 16	3 99	2 43	11 43	23		2 54	0 43	1 12	0 66	27 549	27 554	27 532			5 78	7 26	6 86	1 67		
23 99	80 91	52 81	91 38	199		24 33	3 18	7 79	5 63	4 539	4 378	4 101			44 92	55 88	52 85	5 02		
2 00	6 74	4 40	7 61	17		2 03	0 39	0 97	0 70	27 538	27 547	27 513			5 62	6 99	6 61	1 67		

JULY TO DECEMBER, 1894.

Difference 6 a.m.	Wet Noon.	Dry 6 p.m.	Totals.	Days Rain.	Date.	Largest Fall.	Wind 6 a.m.	Noon.	6 p.m.	Aneroid 6 a.m.	Noon.	6 p.m.	Months. Year.	Cloud 6 a.m.	Noon.	6 p.m.	Crater 6 a.m.	Noon.	6 p.m.
1 61	6 54	3 76	3 32	12	19th	1 61	0 51	0 77	0 69	...	...	...	July '94	4 03	4 59	4 73	1 57	0 77	MS. undecipherable.
2 34	8 96	4 23	0 31	4	14th	0 14	0 84	1 49	1 13	689	697	668	Aug. do	2 52	5 50	3 89	0 54	0 99	
3 77	10 52	8 40	4 39	10	3rd	2 12	0 73	0 96	0 60	664	648	631	Sept. do	1 82	4 39	3 74	1 24	1 00	
4 87	14 01	11 42	0 26	4	28th	0 20	0 40	0 87	0 52	562	568	538	Oct. do	1 38	2 95	4 12	0 17	0 10	
										617	672	612							
3 38	12 66	10 30	3 66	15	28th	1 11	0 54	1 39	1 29	172	186	165	Nov. do	4 80	5 93	5 91	1 57	0 60	
1 35	5 80	4 28	23 91	19	22nd	6 88	0 39	0 92	0 72	194	195	142	Dec. do	3 74	6 96	6 24	1 85	2 33	
										2 339	3 290	3 136							
17 32	58 49	42 39	35 85	64		12 06	3 41	6 40	4 95	6 366	0 381	0 307		18 29	30 32	28 63	8 94	4 47	
										27 648	27 658	27 627							
2 89	9 75	7 06	5 98	11		2 01	0 57	1 07	0 83	27 183	27 890	27 153		3 05	5 05	4 77	1 16	0 94	
										6 536	6 613	6 326							
24 25	82 44	56 98	104 43	201		27 33	5 99	13 14	8 93	0 366	0 351	0 307		52 98	73 90	69 81	4 96	12 47	
										27 594	27 601	27 575							
2 02	6 87	4 75	8 70	17		2 28	5 01	1 09	0 74	27 163	27 890	27 153		4 41	6 16	5 82	1 33	1 38	

VARIOUS PLANTING NOTES.

THE INDIAN TEA CROP.—Full particulars of the original and latest Estimates for the current season's crop will be found in our *Tropical Agriculturist*. Out of a total crop of 138,135,964 lb. for 1895, it is expected that 124,000,000 lb. will be shipped to the United Kingdom. This is against 118,417,084 lb. sent thither in 1894-95.

LIMITED COMPANIES IN CEYLON.—The year 1895 is likely to be a record one in the history of Ceylon in reference to the formation of Limited Companies: here is a list of the 21 Companies registered so far in Ceylon this year, and with a total capital of R10,195,000:—

1895—NAMES OF COMPANIES.	CAPITAL. R.
Colombo Fort Land and Building Coy., Ltd.	750,000
Blackstone Estate Company, Ltd. ..	130,000
Kandy Hotels Company, Ltd. ..	400,000
Kelani Tea Garden Company, Ltd. ..	300,000
Beaumont Tea Company of Ceylon, Ltd. ..	500,000
Ottery Tea Company of Ceylon, Ltd. ..	500,000
Udabage Company, Ltd. ..	300,000
	Noml. Capital
Union Estates Company, Ltd. ..	500,000
Hill Club Company, Ltd. ..	50,000
Gallo Face Company, Ltd. ..	500,000
Claremont Estate Company, Ltd. ..	65,000
Estates Company of Uva ..	750,000
Uvakellie Tea Company of Ceylon, Ltd. ..	500,000
Nyassaland Coffee Company, Ltd. ..	300,000
Kirklees Estate Company, Ltd. ..	100,000
Doomoo Tea Company of Ceylon, Ltd. ..	500,000
Ceylon Provincial Estates Company, Ltd.	1,000,000
High Forests Estates Company. Ltd. ..	1,000,000
Clyde Tea Estates Company, Ltd. ..	300,000
Ruanwolla Tea Company, Ltd. ..	750,000
Ceylon Hills Tea Estates Company, Ltd. ..	1,000,000
Total..	R10,195,000

A NEW LONDON standard of Indian "type tea" comes into force next month. It is said to be about a half-penny a pound inferior to the old.—*Madras Times*.

THE SEASON'S TEA CROP.—The revised estimate of the Indian tea crop, will probably not be issued by the Tea Association for another week or so; but it is generally expected that it will show a reduction on the original estimate, which put the crop at 140,390,520 lb. or 13,262,305 lb. over the actual outturn of the crop of 1894. Shipments to the Colonies and other ports with local consumption were put at 14 millions, leaving about 126¼ million lb. for export to Great Britain, against 115¼ for 1894. Up to the 30th September, however, only 62,254,706lb. have been shipped, against 59,509,612 lb. to same date last year. —*Indian Engineer*.

FALSE BRANDS ON TEA.—Here is what Messrs. Alfred Harvey & Co., of Melbourne and Sydney write in their Monthly Tea Circular received today:—

"Now that the Customs have commenced to prosecute traders for putting false brands upon spirits, it is to be hoped they will next give some of our shippers, importers, or dealers a turn for putting false districts or descriptions upon packages of Tea. How much preferable to printing an untruth would it be to omit the false name of the district, and sell as Orange Pekoe, Pekoe, or Pekoe Souchong. Darjeeling has an envied reputation—so has hill-grown Ceylon and neither should be besmirched."

It is evident therefore that Ceylon teas sent to Melbourne are even now fraudulently misrepresented—to go and call a low-grown tea by the name of a high district, is just as bad as anything that could happen from blending and calling the result, "pure Ceylon teas"; but in Australia as in England there are experts whom nothing of this sort can deceive."

REVIEW OF THE TRADE OF INDIA.

WHAT IS SAID OF TEA, COFFEE, &C.

We have received from the Government of India a copy of the Review of the Trade of India in 1894-95 referring to:—I, Foreign Sea-borne Trade; II, Trans-Frontier Trade; III, Coasting Trade; By J. E. O'Conor, C.I.E., Director-General of Statistics to the Government of India. It is, as usual, an able and full Report covering 72 pages. We had not realized before that Ceylon supplied sugar to India: here are the figures:—

	1890-91	1891-92	1892-93	1893-94	1894-95
	cwt.	cwt.	cwt.	cwt.	cwt.
Ceylon	1,935	1,082	4,921	17,161	7,393

Of practical value is the part devoted to *imports* of tea, which shows that if we cultivated proper relations and equal tariffs with Bombay we ought to supply from Ceylon nearly 5½ million lb. of tea now got from China, Straits and Java. This tea is chiefly for the Persian market, but passes through Bombay:—

Tea.—This trade maintains a high level, though the imports last year were smaller than in 1893-94. The imports are:—

	lb.	Rx.
1890-91	4,770,008	325,141
1891-92	6,353,017	443,161
1892-93	6,022,883	443,336
1893-94	7,687,757	572,006
1894-95	6,326,122	424.666

The sources of supply are China, Ceylon, the Straits and Java, from which countries the imports in the last five years have been:—

		China	Ceylon	Straits	Java
1890-91	lb.	3,940,584	167,177	543,847	97,640
1891-92	,,	4,680,232	849,737	589,953	216,261
1892-93	,,	4,795,473	633,596	464,518	107,100
1893-94	,,	6,016,244	980,507	360,770	308,333
1894-95	,,	4,630,327	901,971	413,417	362,366

The Ceylon tea is consumed in India, but the greatest part of the other imported tea is re-exported, going chiefly to the Persian market by sea, and to the Afghanistan market by land.

Next comes a notable mention of Colombo made in reference to the re-export trade from India:—

With Ceylon the trade is relatively small, not half what it is with the Straits, though being so much closer it might have been supposed that the trade would be larger. The explanation is that Colombo is so happily situated geographically that it is admirably adapted to be an entrepôt for the supply of Southern India and other neighbouring regions, and that there is no necessity for that port to receive supplies of European goods except direct from Europe.

Then we quote what is said about *coffee*:—

The run of high prices has continued now for three consecutive years. The world is so largely dependent on Brazil for its supply now, that Ceylon has given up coffee, and the conditions in that country are so uncertain, that speculative influences have been in successful operation for a considerable time past. The range of high prices has not, however, been effectual in increasing the supply from India materially, for coffee-planting has been beset with difficulty and disappointment and the area under the plant continues to be very restricted. In Travancore, following the example of Ceylon, coffee has been largely abandoned in favour of tea, and in British India, according to the agricultural returns, the area has substantially diminished during the last four or five years.

Next we have a long paragraph on *tea*:—

Tea.—The exports of the last ten years are given below:—

	lb. (*ooo's omitted.*)	Rx.
1885-86	68,784	4,306,133
1886-87	78,703	4,727,992
1887-88	87,514	5,174,440
1888-89	97,011	5,267,315
1889-90	103,760	5,277,650
1890-91	107,015	5,219,233
1891-92	120,149	5,968,129
1892-93	114 722	6,292,348
1893-94	126,332	6,585,835
1894-95	129,099	7,555,745

In 1894-95 the quantity exported greatly increased and the prices obtained were higher even than in 1892-93, which was an unusually good year. The prophecies of the planters that the closure of the mints would be the signal for the ruin of their business have happily not been fulfilled, nor are they likely to be fulfilled. The Average Prices realised at the auction sales in Calcutta during the last six years were as follow, in annas and pie per pound:—

	1889-90.	1890-91.	1891-92.
Orange (and broken orange) pekoe	11-8	11- 2¾	11·1
Broken pekoe	9·9	8·10¾	8-7½
Pekoe	7·5	7- 2	7-0½
Pekoe fannings	5·7	5-10	5-3½
Pekoe souchong	5·7	5- 8¼	5·3⅓
Broken ditto	5·0	5- 8½	4-9⅔
Other low class	4-8	5- 2	4·2⅓

	1892-93.	1893-94.	1894-95.
Or, (and bro. orange) pekoe	13- 0 5-7ths	11- 1⅞	14-0 2-5ths
Broken pekoe	11- 3 1-3rd	9- 2 4-5ths	11-8
Pekoe	8- 9	7- 2⅜	9·4 4-5ths
Pek fans.	6- 7 1-5ths	5- 7 1-5ths	7-3 6-7ths
Pek sou.	6- 5¼	5- 4 4-5ths	7-2 5-7ths
Broken ditto	5-10 6-7ths	4-11 5-6ths	6-8 1-5ths
Other low class	5- 0⅓	4- 5¾	5-6

The Exports are, in pounds (ooo's omitted):—

	1889-90.	1890-91.	1891-92.
United Kingdon	98,731	100,209	111,169
Australia	3,419	5,119	5,204
Persia	1,118	1,221	2,789
Turkey in Asia	65	89	340
United States	103	79	83
Canada	85	61	102

	1892-93.	1893-94.	1894-95.
United Kingdom	108,513	116,007	118,417
Australia	3,908	6,240	4,872
Persia	1,407	2,497	3,173
Turkey in Asia	115	456	1,399
United States	50	116	228
Canada	39	113	317

The United Kingdom continues to be the great market for Indian tea, as much as 92 per cent of the exports of the year having been shipped thither. Of the small quantity not shipped to the United Kingdom, Australia takes a considerable but unfortunately not an increasing share: Indian tea seems to make no headway in the Colonies in competition with China and Ceylon tea. Persia during the last four years has been taking larger quantities. As regards the trade with Persia Her Majesty's Consul at Bushire writes in his report for 1894: "There has been a strong demand throughout the year for Indian and Batavian teas, which seem to be steadily supplanting the China teas in favour with the Persian consumer. Heavy consignments, chiefly from India, were received by native merchants who found no difficulty in disposing of them at a good profit. It was, however, at the port of Bandar-Abbas that this trade received its most vigorous impulse, the import being more than double that of the previous year." Some of the tea at any rate imported into Bandar-Abbas was destined for consumption in Russian Asiatic territory, and it seems probable that the effect of recent fiscal arrangements of the Russians will divert the transit trade to Batoum and the trans-Caspian railway. A new feature in the trade of the year is the largely increased export to Asiatic Turkey, and it is to be hoped that the exports to this country may become larger. Exports to the United States and Canada have also developed very greatly, though the aggregate is still relatively trifling.

Calcutta is now, and always will be, the great centre whence Indian tea is exported; but, in consequence of the increasing demand from Persia and Asiatic Turkey, the exports from Bombay and Karachi are increasing.

The distribution last year was as follows:—

Bengal 123,000.733 lb.; Bombay 2,828,746 lb.; Sindh 1,067,359 lb.; Madras 2,149,006 lb.; Burma 53,472 lb. Total 129,099,316 lb.

To the quantity of tea given above as exported from British India should be added about 780,000 lb. exported from Travancore and Cochin.

Then on *cinchona bark* :—

Cinchona bark is the only separate item of importance in the group "Drugs and Medicines," and this article has rapidly lost a great measure of its importance in recent years owing to the competition of other countries having so lowered the price of the drug, which planters once thought would be the source of untold wealth, as to make it what is commonly called "a drug in the market."

The exports would have been even smaller during the last two or three years if their volume had not been kept up by the bark sent for sale from estates whose owners got rid of their trees, root and branch, finding chinchona bark not worth the expense of cultivation. But though the bark has ceased to justify the expectations once formed of it as an article of export, and India will probably under ordinary circumstances never be a large exporter of the article, the cultivation of the tree by the Government has had a most useful effect in supplying large quantities of febrifugal alkaloids and the sulphate of quinine to the fever-stricken population of malarious regions in India.

It is of interest to quote the following in view of Mr. Crawford's local Cutch Company:—

Cutch.—This trade has not, as figures go, a flourishing aspect, the exports being:—

	Cwt.	Rx.
1890-91	156,493	236,355
1891-92	197,059	317,296
1892-93	229,316	382,484
1893-94	187,115	337,890
1894-95	155,032	292,136

The limitation of the trade is, however, ascribed by the Chief Collector of Customs in Burma, whence the bulk of the article is exported, not to absence of demand but to absence of supplies due to "the Government having further limited the issue of licenses in some of the cutch-producing districts and to the period allowed for cutch-boiling having been reduced from six to four months; also to the extension of forest reserves." The demand from outside markets, he says, was fairly good.

And finally there is mention made of trade across the frontiers North and North-East, as well as North-West of India which includes some *tea* :—

	1893-94.	1894-95.
Tea:	Rx.	Rx.
India	40,751	33,727
Foreign	59,999	46,328

THE CONSOLIDATED ESTATES COMPANY, LIMITED.

The General Managers have the pleasure to submit their Fourth Annual Report and Balance Sheet, together with Statement of Accounts for the Crop Year ending 30th June, 1895.

The Profit and Loss Account shows a balance (including £160 8s 11d brought forward from last year) of £2 700 13s 10d after paying Interest on the Debentures, and an Interim Dividend of 4 % on the Preferred Shares.

Out of this sum the General Managers propose:

	£	s.	d.
To pay a Balance Dividend of 4 % on the Preferred Shares, which will absorb	320	0	0
To set aside for redemption of five per cent of the Debentures at 103 ...	618	0	0
To write off from the Factory Account the sum of	800	0	0
To pay a Dividend of 8 % on the Ordinary Shares, which will require ...	800	0	0
Carrying forward the Balance, viz:	162	13	10
	£2,700	13	10

The following shows the result of the year's working, viz.:—

Net proceeds of Crop, viz.:—

Average net Price	£	s.	d.
Tea, 300,084 lb. About 6⅞d. per lb. ...	8,622	5	11
Interest on Account	36	13	9
	8,658	19	8
Expenditure on Estates, viz.:—			
Messrs. Geo. Steuart & C.'s draft ...	4,707	18	7
Postages and Telegrams	0	5	0
	4,708	3	7
Bonus remitted to Superintendent ...	185	0	0
	4,893	3	7
Net Profit on Cultivation	£3,765	16	1

It will be seen that the crop was slightly in excess of the estimate—being 300,084 lb as against estimate of 300,000—and exchange was somewhat more favorable than was anticipated; while on the other hand the average price realized for the Company's Tea was rather lower than that current when the last report was issued, although slightly above the average price obtained the previous year.

The Shareholders are aware that the Company has recently acquired four new estates on terms which the General Managers believe to be favorable, and to promise satisfactory results. For convenience of reference the following approximate paricculars of all the estates now held by the Company are appended:—

Name of Estate	Ceylon District	Total Acreage	Acres Planted with Tea: Full Bearing	Partial Bearing	Reserve Suitable for Tea	Forest waste, water, etc.
Wattegodde	Dimbula	895	800	Nil	Nil	95
Tallagalla	Kalutara	499	258	22	204	15
Ellagalla	Matale	445	207	13	20	205
Hoonoocotua and Hennewille	Kotmale	713	588	20	55	50
		2552	1853	55	279	365

The last four Estates have been purchased as from 1st July 1895 and therefore the working of them does not appear in the Accounts now presented which are for the Crop Year ending 30th June 1895.

The following are the Estimates of the current season's crops (1895-96) of the Company's Estates:—

	Expenditure, at 1/1½ per Rupee,				Crop
Wattegodde	R82,958 =	£4,666	7	9	300,000 lb. Tea
Tallagalla	32,983 =	1,855	5	10	140,000 ,, ,,
Ellagalla	25,903 =	1,457	0	10	90,000 ,, ,,
Hoonocotua and Hennewille	66,344 =	3,731	17	0	240,000 ,, ,,
	R208,188 =	£11,710	11	5	770,000 ,, ,,

On the basis of exchange as above and at the prices now current for Ceylon Tea the foregoing Estimates if realized would show very satisfactory results.

It is proposed to plant 70 more acres with Tea on Tallagalla and a few acres on Ellagalla and Hoonoocotua during the current season. The cost of these extensions, and of a small outlay for requisite machinery and withering accommodation, is estimated at about £800. This will be charged to the Factory and Extension Account, but the General Managers propose to continue the present policy of writing off liberally from this Account out of Revenue in prosperous years.

The Preferred Shares to the nominal amount of £9,000 Nos. 801—1,700, both inclusive, and Ordinary Shares to the nominal amount of £9,000 Nos. 6,001—6,900, both inclusive, which were issued on 1st July

last, and are included in those enumerated in the annexed Balance Sheet, do not participate in the Dividends now proposed to be paid, these Dividends having been earned during the Crop Year which ended on 30th June last. For the same reason the Debentures to the nominal amount of £23,000, Nos. 121—350, will not participate in the next drawings for redemption. ARBUTHNOT, LATHAM & Co.,
GENERAL MANAGER.

33, Great St. Helens, E.C.,
23rd September, 1895.

THE INDIAN TEA CROP.

In their circular of the 16th April last, the General Committee of the Indian Tea Association gave an estimate of the outturn of the present season's crop of Indian tea based upon the following figures, which they had been able to collect:—

ORIGINAL ESTIMATE OF CROP OF 1895.

	lb.
Assam - - -	57,531,490
Cachar - - -	19,405,880
Sylhet - - -	22,272,000
Darjeeling - - -	8,069,210
Terai - - -	3,176,000
Dooars - - -	19,864,240
Chittagong - - -	842,000
Chota Nagpore - -	238,800
Kangra - - -	3,000,000
Dehra Doon and Kumaon -	2,000,000
Private and native gardens -	4,000,000
	140,390,520

From the figures which have since been obtained, a revised estimate has been prepared, based upon actual results to the 31st August, as follows:—

	Manufactured to 31st Aug. 1894. lb.	Manufactured to 31st Aug. 1895. lb.
Assam -	32,987,585	34,286,191
Cachar -	10,783,203	10,332,442
Sylhet -	10,695,213	11,967,318
Darjeeling -	5,164,574	6,089,418
Terai -	2,004,966	1,707,738
Dooars -	8,983,916	10,802,538
Chittagong -	459,257	361,759
Chota-Nagpore -	91,061	131,231
	71,169,775	75,678,535

REVISED ESTIMATE OF CROP OF 1895.

	lb.
Assam - - -	56,874,241
Cachar - - -	17,421,950
Sylhet - - -	22,910,208
Darjeeling - - -	8,479,854
Terai - - -	2,472,116
Docars - . -	20,044,489
Chittagong . - -	921,746
Chota-Nagpore - -	203,360
Kangra - - -	2,808,000
Dehra Doon & Kumaon (Estimate)	2,000,000
Private & native gardens do -	4,000,000
	138,135,964

being 2,254,556 lb. less than the original estimate of the crop. Estimating shipments to the Colonies and other ports with local consumption at 14 millions, there would remain about 124 million lb. for export to Great Britain. Actual shipments to date to Great Britain are 66,389,121 lb as against 61,908,561 lb. to same date last year.—*Madras Times*, Oct. 17.

THE DUTY ON TEA IN W. AUSTRALIA.—A gentleman writes from Perth, W. Australia, to a contemporary:—"As you are probably aware, our Government has placed tea on the free list, and the new tariff came into operation on the 1st September. The duty on tea has always been 4d. per lb., so that you will see the removal of such a heavy duty all at once has simply demoralized the market here. Teas are selling locally below cost."

CINCHONA IN INDIA.

Our Simla correspondent telegraphs us concerning a table compiled by Mr. O'Conor with respect to the cinchona industry in India. Statistics show, we are told, that there has been a steady decline in the cultivation of this product, the area under cultivation in 1886-87 and in 1894-95 being shown as follows:—

	1886-87. Acres	1894-95. Acres
Madras ..	8,989	5,819
Bengal ..	3,524	2,508
Mysore ..	271	350
Coorg ..	1,707	32
	14,491	8,709

We are not in a position to question the accuracy of these fiugures, but the remark that the table points conclusively" to a *steady* decline of the cinchona industry in India would appear to be challenged so far as Madras is concerned by a Blue-Book now before us. In a statistical abstract relating to British India for 1882-83 to 1891-92—a parliamentary blue-book—we find the area under Cinchona in 1891-92 given as follows:—

Coorg .. .. 63 acres
Madras .. ..10,799 ,,

so that in 1891-92 there was a larger area under Cinchona in this Presidency than there was in 1886 87 in Madras, Mysore and Coorg combined. There can, however, be no doubt that the Cinchona industry even in Madras is not what it was. For this the Government itself is partly to blame, but the main influence appears to have been the downward rush of prices that occurred a few years ago in consequence of Supply greatly exceeding Demand.—*Madras Times.*

EXTRAORDINARY SINGLE LEAVES ON THE VICTORIA REGIA.

From the measurements given in a recent issue of the *Gardeners' Chronicle* of leaves of the Victoria Regia in the Royal Botanic Society's Garden, Regent's Park, London, it would appear as though some of the leaves upon a plant of the same species growing in the Sheffield Botanic Garden are still larger. I have never seen a more vigorous plant, or one with finer leaves, than the Sheffield specimen. The tank in which the plant is growing is 28 feet in diameter, and even this width is insufficient for the leaves to develop fully, as they get damaged by being squeezed against the sides of the tank. The surface of the water is entirely covered with leaves; the flowers are large and numerous, and at the time of writing there are flower-buds in various stages of development showing above the surface of the water. Today, September 24, the largest leaf measured was 7 feet 3¾ inches in diameter, inside measurement, with a turned up margin 3½ inches high, which gives the full measurement of 7 feet 10½ inches diameter. The next largest leaf is 7 feet 2 inches. Then there are three of 7 feet 1 inch, and 2 of 7 feet; two younger leaves, each 6½ feet and another 5½ feet. There are also upon the plant three smaller ones. Four leaves have been cut from the plant, each of which measured upwards of 7 feet in diameter. All the above measurements were taken inside, without calculating the rims, which vary from 3 to 4 inches in depth.—*William Harrow*, in "Gardeners' Chronicle."

DEAFNESS. An essay describing a really genuine Cure for Deafness, Ringing in Ears &c., no matter how severe or long-standing, will be sent post free.—Artificial Eardrums and similar appliances entirely superseded. Address THOMAS KEMPE, VICTORIA CHAMBERS, 19, SOUTHAMPTON BUILDINGS, HOLBORN LONDON.

INDIAN TEA SALES.

(From *William Moran & Co.'s Market Report.*)

CALCUTTA, Oct. 30th, 1895.

TEA.—The sales held since our last have comprised about 41,000 chests, all of which were sold. Prices all round have been somewhat lower, the fall being most noticeable on good to fine qualities We hear that there has been some rain in Cachar and also in the Dooars, but the weather continues cold and manufacture must be shortly closing. Owing to this it is possible that the quantity available for export to Great Britain may not reach 20,000,000 lb. Tomorrow about 21,500 chests will be offered.

TOTAL QUANTITY OF TEA PASSED THROUGH CALCUTTA FROM 1ST APRIL TO 28TH OCT.

	1895	1894	1893
Great Britain ..	80,426,934	77,584,510	72,045,580
Foreign Europe ..	192,023	182,485	231,809
America ..	830,631	346,941	90,340
Asia ..	2,771,022	2,692,344	1,752,238
Australia and New Zealand ..	3,903,449	3,185,967	3,595,197
	88,124,059	83,992,247	77,715,164

(From *Watson, Sibthorp & Co.'s Tea Report.*)

CALCUTTA, Oct. 30th, 1895.

In sympathy with London the sales held here on the 24th instant passed off without spirit; really good liquoring teas alone being much wanted and for these full prices were paid, but for all other sorts the market was lower; teas under six annas were only fractionally easier, but a decline of from 3 to 6 pie may be quoted on all grades above this price. 22,735 packages changed hands.

The average price of the 22,735 packages sold is As. 8-1 or nearly 8⅝d per lb. as compared with 18,763 packages sold on the 25th October 1894 at As. 9-3 or about 9¼d per lb. and 25 404 packages sold on the 26th October 1893 at As. 6-9 or about 8¼d per lb.

The Exports from 1st May to 26th October from here to Great Britain are 80,249,154 lb. as compared with 76,438,773 lb. at the corresponding period last season and 69,660,087 lb. in 1893.

NOTE.—Last sale's average was As. 8 or about 8½d per lb.

Exchange.—Documents bills 6 month's sight, 1s 1-15-6d.

Freight.—Steamer—£1-12-6 per ton of 50 c. ft.

HAWAIIAN TEA AND COFFEE CULTURE.

The Hawaiian Coffee and Tea Co. of North Kona have now on the market some native-grown tea from their plantation in that district. The brand is known as "Kona Tea" and each package in addition to the usual advertisements bears the following: "This package contains absolutely pure tea, prepared by machinery from the best Ceylon Hybrid." The flavor of this tea is similar to that of the well-known English Breakfast tea. The Company has about five acres which produces a very satisfactory yield. Unfortunately, however, the expense of harvesting is a great draw-back at present and is another convincing proof that the government will have to direct its energies to providing for enough cheap labour to meet the demand of planters engaged in the various kinds of agriculture and fruit culture at the proper season. This country cannot compete in foreign markets against other tropical countries unless it is on an equal footing as regards labour. As soon as the tea and coffee industries begin to approach the extent of development we all look for there will have to be an abundance of labour at hand when required otherwise disastrous failure will be the result. As the coffee season only lasts a few months it will be necessary to provide employment for the labourers required during the coffee season, in the interval. To do this successfully, crops that will alternate with sugar cane and coffee must be cultivated and the sooner a start is made in this direction the better.—*Hawaiian Commercial and Maritime Report.*

DRUG REPORT.

(From *Chemist and Druggist.*)

London, Sept. 26th.

CAFFEINE—Unaltered at 21s on the spot; the forward quotation remains the same as last week.

CINNAMON—At the end of last week a parcel of 100 bales sold at 9½d per lb c i f terms, for August-October shipment.

CROTTON-SEED—Very scarce, and almost unobtainable on the spot. The value of fair East Indian is now from 35s to 36s per cwt.

ESSENTIAL OIL—Lemongrass oil, which had been somewhat neglected lately, has become firmer again, and several transactions are reported for arrival. On the spot 1¾d to 2d, landed terms has been paid, and about 400 cases have found buyers at 1½d rising to 1 17-32d per oz "c i f" for September-October steamer, and 1⅝d per oz "c i f" for September-January steamer shipment. Citronella oil offers on the spot at 1s 3½d to 1s 4d per lb according to quantity, and for shipment there are sellers at 1s 1d c i f terms.

QUININE has been more active, and closes at an advance of about ¼d on last week's rates about 30,000 oz having found buyers on Monday and Tuesday at 1s 1¼d per oz for second-hand German brands in bulk. Business in second-hand, however, is somewhat hampered by the fact that there is only ⅛d per oz difference now between the manufacturers' price and that of second-hand holders. The market closes very firmly, with few sellers at 1s 1½d per oz.

London, October 3rd.

KOLA.—Still tending easier. Of 31 packages offered today, 8 West Indian sold at from 10d to 11d for good, and from 7d down to 4d for ordinary to very poor.

QUININE Again slightly dearer, with sales of about 5,000 oz second-hand German bulk at 13⅝d per oz

ESSENTIAL OILS—Cinnamon oil was bought in at 1s per oz., but 8d per oz would be taken for fair quality. For Lemongrass 1⅝d per oz, c. i. f. is said to have been paid, which would be dearer. Citronella is also higher. On the spot 1s 4d per lb is reported paid; for shipment the quotation is 1s 3d per lb c i f for drums, but there are no buyers over 1s 2¾d per lb.

THE CLYDE TEA ESTATES COMPANY, LIMITED.

The prices given for the properties purchased are as follows:—

1. Clyde (including Enselwelle)...R150,000
2. Liskillin ... ...R 48,000
3. Kaluganga... ... ...R 43,000

The extents are:—(1) 320 acres, 241 in tea; (2) 205 acres, 137 in tea; (3) 186 acres and 130 in tea—the age of the tea has, of course, to be considered in each case.

A "CRACK" TEA ESTATE FOR SALE.

The death of Mr. K. C. MacIver has thrown his Lippakelle estate into the market and all Dimbula is watching to see if it will realize £100 sterling per acre, and so top the record for Ceylon. This price is not outrageous, if it be true that the profits for four years averaged from £15 to £16 per acre, so beating the return for any property in Ceylon. It is not settled yet whether Lippakelle may be put up to public auction: this course will be adopted if it is not sold privately.

THE BEST SOAPS FOR WARM CLIMATES are CALVERT'S TOILET SOAP (6d. Tablets) and PRICKLY-HEAT SOAP (6d. and 1s. bars), pleasantly perfumed, for Bath or Toilet, containing 10 per cent. of Pure Carbolic. Very serviceable as preventatives of Prickly-heat and other skin irritation. Sold at Chemists, Stores, &c.

F. C. CALVERT & CO., MANCHESTER.

COLOMBO PRICE CURRENT.

(*Furnished by the Chamber of Commerce*).

Colombo, Oct. 28, 1895.

Exchange of London, Closing Rates, *Bank Selling Rates*:—On demand 1/1 13-16 to 27-32; 4 months' sight 1/1 27-32 to ⅞; 6 months' sight 1/1⅞ to 29-32 *Bank Buying Rates*:—Credits 3 months' sight 1/1 31-32 to ½; 6 months' sight 1/2 to 1/2 1-32; Docts. 3 months' sight 1/2 to 1/2 1-32; 6 months' sight 1/2 1-32 to 1/2 1-16.

Coffee.—Plantation Estate Parchment on the spot per bushel, R17 to 18.—quite nominal. Estate Crops in Parchment, delivery to Feb. 28,—no quot,. Plantation Estate Coffee, f.o.b. on the spot per cwt, R83 to 85.—quite nominal. Plantation Estate Coffee f.o.b. Special Assortment per cwt.—no quot., Liberian parchment on the spot per bushel, R12·50. Garden and Chetty Parchment on the spot per bushel.—no quotations. Garden and Chetty Coffee f.o.b. per cwt.—no quot. Native Coffee f.o.b. per cwt. R73.—quite nominal.

Tea.—Average Prices ruling during the week: Broken Pekoe, per lb 61c. Pekoe per lb 45c. Pekoe Souchong, per lb 31c. Broken mixed and Dust, per lb 30c.—Averages of Wednesday's sale.

Cinchona Bark.—Per unit of Sulphate of Quinine per lb 1½c. to 3c.—1 to 4 %.—Nominal. Twigs and Branch.—No quotations.

Cardamoms.—per lb 80c. to R1·50.

Coconut Oil.—Mill oil per cwt, R15·12½.—Nominal. Dealer's oil per cwt, R14·90 to 15·00.—Nominal. Coconut oil in ordinary packages f.o.b. per ton R332·50 to 335.—Nominal.

Copra.—Per candy of 560 lb R40·00 to R49·00.

Coconut Cake: (Poonac) f.o.b. per ton, R42·00 to 50·00.

Cocoa.—(Unpicked & undried) per cwt, R35 to R48.—Nominal.

Coir Yarn.—Nos. 1 to 8 { Kogalla per cwt. R7 to 19. Col. side ,, R6·50 to 16. }

Cinnamon.—Nos. 1 & 2 only per lb 65c.—Nominal. Ordinary Assortment, per lb 60c.—Nominal.

Plumbago:—Large Lumps per ton, R150 to 330. Ordinary Lumps per ton, R130 to 290. Chips per ton, R80 to 140. Dust per ton, R30 to 90.

Ebony: per ton.—none offering.

Rice.—Soolye per bag, R7·25 to R8·00.
Pegu and Calcutta Calunda per bag R7·50 to R8·10.
Coast Calunda per bushel, R3·15 to R3·40.
Muttusamba per bushel, R3·40 to R3·75.
Kadappa and Kuruwe per bushel,—No quotations.
Rangoon Raw 3 bushel, bag, R10·00.

Freights.

Cargo.	Per ton London per str.	N. York per str.	Trieste per str.	Mar'lles per str.	Hamb', Bremen &c.
	s. d.	s. d.	s. d.	R. c.	s. d.
Tea	25/	..	25/	25	22/6
Coconut Oil	25/	..	25/	25	22/6
Plumbago	22/6	..	25/	25	22/6
Coconuts in bags	..	..	25/	25	22/6
Other Cargo	..	..	25/	25	22/6
Broken Stowage	12/6	..	25/	25	22/6
SAILERS.					
Coconut Oil	..	32/6	..	..	..
Plumbago	..	..	..	..	..

New York rates per steamer with transhipment 12/6 @ 15/ above London rates.

LOCAL MARKET.

By Mr. A. M. Chittambalam, 7, Baillie St., Fort.

Colombo, Nov. 2nd, 1895.

Garden Parchment :—	R15·00 to 15·25	per bushel
Chetty do :—	15·50 to 16·00	do
Native Coffee :—	65·00 to 66·00	per cwt
do f.o.b. :—	72·00 to 73·00	do
Liberian Parchment,	13·00	per bushel (nominal)
do Coffee,	67·00	per cwt
Cardamoms.—	0·70 to 2·00	per lb (nominal)
Cocoa.—(nominal)	35·00 to 45·00	per cwt do
Rice.—Market is Likely to go down.		
Kazla	R6·50 to 6·75	per bag
Soolye	7·00 to 7·50	do
Callunda	7·50 to 7·75	
Coast Callunda	3·00 to 3·06	per bushel
Kuruve (New)	3·75 to 3·87	do
Muttusamba	3·25 to 3·50	do

Cinnamon.—Quoted Nos. 1 to 4, at 58c and Nos. 1 and 2 at 62 cents per lb (nominal)

Chips.—R80·00 per candy (nominal)

Coconuts.—Ordinary	R35·00 to 38·00	per 1,000 (nominal)
do Selected	40·00 to 43·00	do do
Coconut Oil.—	14·75 to 15·00	per cwt do
Copra.—Market quiet:—		
Kalpitiya	R46·00 to 46·50	per candy
Marawila	44·00 to 45·00	do
Cart Copra	39·00 to 43·00	do
Poonac.—Gingelly	77·50 to 82·50	per ton
Chekku	75·00 to 80·00	do
Mill (retail)	50·00 to 55·00	do
Ebony.—quotations at	R100 to R185	(nominal)
Satinwood.—cubic feet	1·50 to 2·12	do
Halmilla.— do	1·75 to 2·00	do
Kitul Fibre.—Quoted at R30·00		per cwt (nominal)
Palmyra Fibre.—Quoted nominally:—		
Jaffna Black.—Cleaned (Scarce)		
do Mixed	do	
Indian do	R7·00 to 9·00	per cwt,
Do Cleaned	10·00 to 14·00	
Sapan Wood.—Quoted	65·00 to 70·00	per ton
Kerosine Oil—American	6·55 to 6·60	Per case
do Russian	3·00 to 3·05	do
Kapok.—Cleaned f. o.b :—	27·00 to 27·50	(nominal)
do Uncleaned	6·00 to 6·50	(Scarce)
Croton Seed	13·00 to 17 00	do
Nux. Vnomica	2·50 to 3·00	per cwt

CEYLON EXPORTS AND DISTRIBUTION 1894-1895.

(Corrected to date.)

COUNTRIES.	Coffee cwt. Plantation	Coffee cwt. N'tive	Coffee cwt. Total.	Cinchona. 1895 B'nch & Trunk lb	Tea 1895 lb.	Tea 1894 lb.	Cocoa cwt.	C'moms lb.	Cinnamon. Bales lb.	Cinnamon. Chips lb.	Coconut Oil. 1895 cwt.	Coconut Oil. 1894 cwt.	P'bgo. 1895 cwt.
To United Kingdom	42069	36	42105	557924	69904995	62154683	19744	174987	1148249	313953	123078	176770	88161
,, Austria	3176	100	3276	..	3863	5252	161	..	6000	5600	18914	27150	..
,, Belgium	25	..	25	90728	8113	6671	917	..	27000	22100	3904	9810	11778
,, France	913	1056	1969	7900	32276	10970	473	80	24300	25200	404	483	433
,, Germany	649	..	649	..	199776	128660	784	41893	216315	166600	12779	23970	30081
,, Holland	1	..	1	20474	11381	600	..	..	..	..	401	..	4069
,, Italy	1	..	1	21647	7807	1695	50	..	100800	67763	706	7148	140
,, Russia	152	..	152	..	216580	34768	..	..	..	..	..	3906	..
,, Spain	..	..	..	..	51275	39713	45	..	121000	6200	101	99	..
,, Sweden	..	..	..	..	750	..	..	..	..	..	..	..	..
,, Turkey	..	..	..	..	7867	7655	..	..	..	..	..	..	..
,, India	493	1072	1565	..	659196	809442	2	61143	1100	50	4996	21135	358
,, Australia	6715	641	7356	..	7633559	5812448	72	112	4700	12192	1983	2702	768
,, America	740	74	814	136501	344541	174009	1041	5772	70000	22400	127998	107029	121339
,, Africa	..	..	..	..	96782	71491	..	274	..	..	145	..	..
,, China	80	..	80	..	302206	119375	33	1649	45400	..	475	1705	..
,, Singapore	2	..	2	..	27866	16331	..	..	..	..	14284	3709	..
,, Mauritius	372	802	1174	896	139231	84600	..	..	..	..	..	..	..
,, Malta	..	..	..	..	78595	42815	..	..	..	..	..	..	..
Total exports from 1st Jan. to 28th October 1895	55388	3781	59169	836070	79726659		23322	284310	1763864	641978	310168		257126
do 1894	24648	588	25236	2256232	69519831		16440	230411	1587509	475090	385616		279589
do 1893	45907	1964	47871	3131982	67280135		25238	281751	1507697	488100	292879		306659
do 1892	36102	2202	38303	5625565	60834802		15237	360818	1689936	471693	446086		369790

MARKET RATES FOR OLD AND NEW PRODUCTS.

(From S. Figgis & Co.'s Fortnightly Price Current, London, 9th October, 1895.)

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS
ALOES, Socotrine	Good and fine dry liver...	£3 10s a £5
Zanzibar & Hepatic	Common and good ..	30s a 80s
BARK, CINCHONA Crown	Ledgeriana chips ..	2d a 3½d
	Original stem	1¼d a 3d
...	Renewed	2d a 4½d
	Chips	1¼d a 2d
BEES' WAX, White ..	Sli. sof. to gd. hard brig.	£7 10s a £8
Yellow ..	Dark to fair	£6 a £7
Mauritius & Madagascar..	Fair to fine	£6 5s a £6 15s
CAMPHOR, China ..	} Fair average quality..	200s a 205s
Japan ..		
CARDAMOMS—		
Allepee	Fair to fine clipped ..	1s a 2s 6d
Mangalore	Bold, bright, fair to fine .	1s 10d a 2s 8d
Malabar	Clipped bold bright fine	1s 8d a 2s 3d
Ceylon	Middling stalky & lean	1s 3d a 1s 6d
Tellicherry	Good to fine	1s 6d a 1s 8d
	Brownish	9d a 1s 4d
Mysore	Fair to fine plump. clipd	1s 9d a 3s 6d
	,, ,, small ..	1s 2d a 1s 5d
Long Ceylon ...	Shelly to good	1s 1d a 2s 11d
	Seeds ...	1s 10d a 2s 1d
CASTOR OIL, 1st	White	2¾d a 3d
2nd	Fair and good pale ...	2¼d a 2½d
CHILLIES, Zanzibar ..	Fair to fine bright ..	8s a 33s
	Ord'y. and middling ...	24s a 27s
CINNAMON, 1sts	Ord'y. to fine quill ...	1s 3d a 1s 6d
2nds	,, ,, ,, ,, ...	1s 1d a 1s 2d
3rds	,, ,, ,, ,, ...	1s a 1s 1d
4ths & 5ths	Woody and hard	11d a 1s 1d
Chips	Good ordinary ..	2⅞d
CLOVES, Zanzibar and Pemba. }	Fair to fine bright ...	2 1-16d a 2½d
	Common dull and mixed	1⅞d a 2d
,, STEMS	Common to good ...	1d
COCULUS INDICUS ...	Fair sifted	8s a 12s
COFFEE	Bold to fine bold color	105s a 112s
	Midding to fine mid .	97s 6d a 104s
	Low mid and low grown	95s a 99s
COLOMBO ROOT... ..	Good to fine bright sound	10s a 20s
	Ordinary & middling ...	7s a 8s
CROTON SEEDS, sifted...	Ordinary to fine fresh ...	30s a 37s
CUTCH	Fair to fine dry ...	20s a 32s
DRAGONS BLOOD. Zan.	Ordinary to good drop ...	20s a 50s
GALLS, Bussorah & Turkey	Fair to fine dark blue ...	47s a 50s
	Good white and green ..	35s a 40s
GINGER, Calicut Cut A	Good to fine bold	68s a 72s 6d
B & C	Small and medium	50s a 60s
Cochin Rough..	Common to fine bold ...	33s a 36s
,, ...	Small and D's ...	29s a 30s
Bengal Rough	Fair to good ...	21s
GUM AMMONIACUM ..	Blocky to fine clean ...	20s a 50s
ANIMI, washed ..	Picked fine pale in sorts	£9 a £11
	Part yellow & mixed do.	£8 10s a £8 15s
	Bean & Pea size ditto ..	£4 a £7 10s
	Amber and red bold ..	£5 a £7
scraped..	Medium & bold sorts ..	£4 a £7
ARABIC E.I. & Aden...	Good to fine pale frosted sifted	42s 6d a 50s
	Sorts, dull red to fair ...	32s 6d a 40s
Ghatti ...	Good to fine pale selected	35s a 50s
	Sorts middling to good	28s a 34s
Amrad cha	Good and fine pale ...	35s a 50s
	Reddish to pale brown ...	27s 6d a 32s
Madras ...	Dark to fine pale ...	20s a 33s 6d
ASSAFŒTIDA	Fair to fine pinky block and drop	45s a 80s
	Ordinary stony to middling	15s a 40s
KINO	Fair to fine bright ..	£25 a £30
MYRRH, picked	Fair to fine pale ...	£4 10s a £6
Aden sorts	Middling to good ...	60s a 70s
OLIBANUM, drop..	Fair to fine white ...	30s a 55s
,,	Reddish to middling ..	20s a 25s
pickings...	Middling to good pale ...	8s a 14s
siftings	Slightly foul to fine .	9s a 13s
INDIARUBBER	Red hard clean ball ...	2s 1d a 2s 5d
East African Ports, Zanzibar and Mozambique Coast	White softish ditto ...	1s 9d a 2s 2d
	Unripe root	10d a 1s 4d
	Liver and Lamu Ball ...	1s 8d a 2s 1d
	Sausage, ordinary to fine	1s 3d a 2s
	,, without sticks	2s 2d a 2s 5d
Assam	Good to fine ...	1s 7d a 2s 2d
	Common foul & middling	9d a 1s 5d
Rangoon	Fair to good clean .	1s 6d a 2s 2d
Madagascar, Tamatave, }	Good to fine pinky & white	2s 1d a 2s 5d
Majunga and Nossibe }	Fair to good black ..	1s 6d a 1s 9d
ISINGLASS or FISH MAWS } Tongue.	{ good to fine pale ...	1s 10d a 2s 9d
	{ dark to fair ..	9d a 1s 6d
Bladder Pipe	Clean thin to fine bold...	1s 8d a 2s 9d
Purse...	Dark mixed to fine pale...	5d a 1s 2d

EAST INDIA. Bombay, Ceylon, Madras Coast and Zanzibar.	QUALITY.	QUOTATIONS.
Kurrachee Leaf ..	Good and fine pale	2s 3d a 3s
	Red part thin ..	1s 6d a 2s 2d
INDIGO Bengal	Middling to fine violet...	4s 8d a 5s 6d
	Ordinary to middling ...	3s 3d a 4s 6d
Kurpah	Fair to good reddish violet	2s 10d a 3s 6d
	Ordinary and middling	1s 10d a 2s 8d
Madras (Dry Leaf)	Middling to good ...	1s 8d a 3s
	Low to ordinary ...	7d a 1s 5d
IVORY—Elephants' Teeth		
60 lb & upwards ...	Soft sound	£52 a £65
over 30 & under 60 lb	,, ,,	£50 a £60
60 a 100 lb. ...	Hard ,, ,,	£38 a £43
Scrivelloes ...	Soft ,, close & wide	£23 a £35 10s
Billiard Ball Pieces 2⅝ a 3¼in.	Sound soft	£90 a 10s a £105
Bagatelle Points ...	Sli. def. to fine sound soft	£57 10s a £83
Cut Points for Balls ..	Shaky to fine solid sd. sft	£70 10s a £76
Mixed Points & Tips...	Defective, part hard ..	£33 a £41
Cut Hollows	Thin to thick to sd. sft	£23 10 a £39 10s
Sea Horse Teeth — ...		
¾ a 1¼ lb.	Straight crked part close	9d a 3s
MYRABOLANES, Bombay	Bhimlies I, good & fine pale	7s 9d
	,, II, fair pickings	3s 6d a 4s 3d
	Jubblepore I, good & fine pale	5s 3d a 7s
	,, II, fair rejections	3s 6d a 4s 6d
	Vingorlas, good and fine	1s a 5s 6d
Madras, Upper Godavery	Good to fine picked ...	5s 6d a 6s 6d
,, ,, ..	Common to middling ...	3s 3d a 4s 6d
Coast	Fair	4s 4d a 4s 9d
Pickings ...	Burnt and defective ..	3s 3d a 4s
MACE, Bombay ...	Dark to good bold pale	1s 6d a 2s
	W'd com. dark to fine bold	4d a 6d
NUTMEGS, ,, ...	65's a 81's	2s 3d a 3s 2d
	90's a 125's	1s 5d a 2s 1d
NUX VOMICA	Fair to good bold fresh	6s a 9s
	Ordinary to fair	7d a 1s 6d
OIL, CINNAMON ..	Bright & good flavour...	1⅛d
CITRONELLE ...	,, ,, ,, ...	1⅜d
LEMONGRASS ...		
ORCHELLA WEED { Ceylon ..	Mid. to fine, not woody	11s a 15s
Zanzibar	Picked clean flat leaf ...	12s a 18s
Mozambique	,, wiry	22s a 32s
PEPPER—		
Malabar, Black sifted ..	Fair to bold heavy .. }	2¼d a 2½d
Alleppee & Cochin ..	,, good ,, ... }	
Tellicherry, Black ..	,, ,, ..	
PLUMBAGO, Lump ..	Fair to fine bright bold	15s a 16s
	Middling to good small	3s 6d a 13s
Chips ..	Dull to fine bright	1s 6d a 8s 6d
Dust ..	Ordinary to fine bright...	2s a 6s
RED WOOD	Fair and fine bold ...	£3 10s a £4
SAFFLOWER, Bengal	Good to fine pinky nominal	95s a 100s
	Ordinary to fair ...	70s a 80s
	Inferior and pickings ...	30s a 50s
SANDAL WOOD, Logs	Fair to good flavour ...	£30 a £50
,, ,, Chips..	Inferior to fine ..	£4 a £8
SEEDLAC	Ordinary to fine bright	50s a 100s
SENNA, Tinnevelly ..	Good to fine bold green	6d a 8d
	Fair middling medium	3d a 5½d
	Common dark and small	1d a ¾d
Bombay	Ordinary to good ...	1d a 2d
SHELLS, M.-o'-P.	EGYPTIAN—bold clean	55s a 60s
	medium thin and stout	65s a 82s 6d
	chicken, part oysters	6 s 6d a 77s 6d
large	BOMBAY—poor to fine thick	67s 6d a 75s
medium part stout	clean part good color	75s a 82s 6d
chicken part stout	,, ,, ,,	72s 6d a 82s 6d
oyster & broken pcs	,, ,, ,,	75s a 82s 6d
Mussel	medium and bold sorts	37s a 45s
	small and medium sorts	15s a 20s
Lingah Ceylon	Thin and good stout sorts	9s a 20s
TAMARINDS	Mid. to fine black not stony	9s a 11s
	Stony and inferior ...	4s a 6s
TORTOISE-SHELL ...	Sorts, good mottle, heavy	21s a 30s
Zanzibar and Bombay	Pickings thin to heavy .	5s a 21s 6d
TURMERIC, Bengal ...	Leanish to fine plump, finger ...	8s 6d a 9s 6d
Madras ...	Fin. fair to fine bold bright	8s 6d a 9s 6d
,, ..	Mixed middling	7s 6d a 8s
,, ...	Bulbs	6s 6d a 7s 6d
Cochin ...	Finger	7s a 7s 6d
VANILLOES,		
Bourbon, 1sts ...	Fine, cryst'ed 5 to 9 in	19s a 23s
Mauritius, 2nds ..	Foxy & reddish 5 to 8 in.	14s a 20s
Seychelles, 3rds ..	Lean & dry to mid. under 6 in. ...	8s a 12s
Madagascar, 4ths..	Low, foxy, inferior and pickings	6s a 9s

THE
AGRICULTURAL MAGAZINE,
COLOMBO.
Added as a Supplement Monthly to the "TROPICAL AGRICULTURIST."

The following pages include the Contents of the *Agricultural Magazine* for November:—

Vol. VII.] NOVEMBER, 1895. [No. 5.

AGRICULTURAL EDUCATION.

BRIEFLY stated, the object of agricultural education is to teach the most enlightened methods in the cultivation of the soil, so that the cultivator may secure the best results while the fertility of his land is maintained. As the wealth of a nation depends upon the agriculture of the country, it is but fitting that agricultural education should receive Government aid in as large a measure as any other department of education. At the same time agricultural education should be made as attractive as possible to all, for there are few persons, particularly in the Colonies, that have not a direct or indirect interest in the soil. It is a mistake to imagine, as some do, that the results of agricultural teaching can be gauged by the number of scholars, who after their training at school cultivate their own lands. If this test were applied to agricultural colleges abroad, it will be found that the majority of those who are being trained at these schools are by no means intended to be farmers. The more the individuals of a community—no matter in what capacity they are serving, whether as professional men, Government servants, or in private employ—know of agriculture, of the soil and the plant in all their bearings, the better for the community and the country to which they belong. We do not think of limiting the literary education of a boy because he may not intend to be a literary man, or what is popularly called his "scientific education," because he has not made up his mind to be a worker in science. The object of education in its widest sense is, we take it, to expand the mind and enable men to think and act under the various circumstances in which they may be placed. It is but meet that we should make themselves acquainted with our natural surroundings—the soil, the air, plants and animals, and the various relations in which they stand to one another. Unfortunately there are some people who are proud to own their ignorance of these matters, and others who imagine or pretend that they know all about them, when in fact their ignorance is prodigious.

In this country we should greatly desire to see all minor native officials possessed of an up-to-date knowledge of agriculture, such as will equip as well as actuate them to take an active, intelligent, and honest interest in the welfare of their more ignorant and conservative brethren who are engaged in agricultural operations.

OCCASIONAL NOTES.

The fertility of soils is always a subject of interest, and we therefore direct attention to a series of papers on this subject written by Professor Edward Kinch, the well-known chemical lecturer at Cirencester, the first of which appears in our present issue.

We have been favoured with a copy of the "Memoranda of the origin, plan, and results of the field and other experiments conducted on the farm and in the laboratory of Sir John Bennett Lawes, Bart., D.C.L., LL.D., Sc.D., F.R.S., at Rothamsted, Herts." The present year is the fifty-second year of the experiments. The pam-

phlet is replete with facts and figures derived from all manner of experiments with crops, manures, food-stuffs, &c., and should prove a valuable work of reference.

Whether the operations of the Cutch Company in the Eastern Province will result in the ultimate extirpation of the mangroves that flourish in our tidal areas is more than we can say, but the protest that has been raised in Jamaica against the destruction of the mangrove in that colony and the claim put forward for this tree as a sanitary agent are undoubtedly of local interest. The mangrove is said to solidify the mud where it vegetates and to raise it. From the leaves, bark and seeds which fall from the mangrove, we are told that the mud receives an immense amount of tannin—a powerful antidote against putrefaction. By catching and solidifying the mud it keeps it form spreading, and while preventing the increase of the fixed shell-fish aid the multiplication of other species, particularly the crabs—the greatest consumers of organic matter deposited on the banks. It is further stated that where the mangrove flourished, yellow fever and other disorders of an endemic character were unknown. If these statements are founded on fact, it would be well for us to take heed lest in our anxiety to encourage enterprise, we open the door to fresh evils.

Dr. George Watt suggested enquiry into the possibility of increasing the yield of Cutch by acacia catechu, by mechanical or other injuries to the plant. Dr. Leather, the argicultural chemist, remarks that it "appears to be probable that catechin can be drawn from the trees by wounding them, for it is a solid substance found in the heart-wood." The Director of the Imperial Forest School states, "if catechin were a gum obtained by exudation and chiefly from the sap-wood, no doubt wounding the trees would increase the production, but it is not a gum but a substance found in the heart-wood, and wounding could have little or no effect." In spite, however, of these opinions, Dr. Watt goes on to point out that the removal of gum or any other mechanical disturbance to the life of the plant through wounds, diseases, drought, &c. might easily enough cause a deposition of crystalline matter within the wood. He further refers to analogous cases thus: "The irritation caused by sand within the oyster shell is believed to be the exciting cause to the formation of the pearl. Barus camphor is deposited within the wood of Dryobalanops camphora very much after the same manner as catcehin (kirsal) within that of acacia catechu. The crystals of that form of camphor are well known to occur within the heart-wood, hence it is said old trees are the most productive. In searching for trees likely to yield camphor, the natives pierce the stems to the heart-wood, thus injuring them materially; but it is said that a tree left for seven or eight years will then be found to contain deposits of camphor freely, so that the tapping process has come to be regarded as facilitating the formation of the much-prized article. The formation of Agar (a crystalline substance found within the wood of Aquilaria agallocha) is believed to be due to some diseased condition. The formation of the crystalline substance *tabashir* within the bamboo has been demonstrated to be due to an insect. A native merchant (according to Mr. Peppe) tried to imitate the action of the insect, with the result that he found that by making a small perforation above a joint in half-mature bamboos the salt formed freely. This he practised systematically and made a considerable sum of money before he finally glutted the market with *tabashir*. (*Dict. Vol. I., 385.*) It is not unusual in fact in agricultural operations to check the growth of plants so as to cause the formation of reserve materials. In the production of *ganja* it is found necessary to remove the male plants since the fertilization of the female destroys the formation of the narcotic. But in some parts of the country (as in Burma) this same result is obtained by injuring the stems. Without mentioning other such examples it may fairly well be said that it remains to be demonstrated that the yield of catechin is not a matter that is capable of control. It was, however, from analogy in similar instances that the writer ventured to make the suggestion that the formation of catechin might be facilitated by mechanical agencies or other disturbances to the life of the plant. This, however, was only a suggestion, though it is one that might still be kept in view."

RAINFALL TAKEN AT THE SCHOOL OF AGRICULTURE DURING THE MONTH OF OCTOBER, 1895.

1	Tuesday	·34	19	Saturday	Nil
2	Wednesday	·14	20	Sunday	2·36
3	Thursday	·08	21	Monday	Nil
4	Friday	·18	22	Tuesday	1·91
5	Saturday	·57	23	Wednesday	3·07
6	Sunday	·10	24	Thursday	1·17
7	Monday	·04	25	Friday	·01
8	Tuesday	1·98	26	Saturday	·22
9	Wednesday	·77	27	Sunday	·59
10	Thursday	·30	28	Monday	·30
11	Friday	·13	29	Tuesday	5·59
12	Saturday	1·00	30	Wednesday	3·91
13	Sunday	·30	31	Thursday	·75
14	Monday	1·78	1	Friday	·07
15	Tuesday	·13			
16	Wednesday	1·03		Total	29·72
17	Thursday	·34			
18	Friday	·90		Mean	·95

Greatest amount of rainfall in any 24 hour on the 29th instant, 5·59 inches.

Recorded by J. D. S. Jayawickrema.

PRINCE KRAPOTKIN'S ARTICLE IN THE "NINETEENTH CENTURY."

Prince Krapotkin has done good service as a chronicler in almost every department of Science, and his summary of the result of the researches into the nature of the relation between the plants, the soil, and the free nitrogen of the atmosphere is a valuable contribution to the literature of the subject.

Nitrogen, in one form or another, exists both in the soil and in the atmosphere, and it is curious to note that apparently contradictory

conclusions resulted from enquiries into the relation of both these sources of nitrogen with plant life, till fresh research in a new direction altogether, helped to reconcile the apparently contradictory results.

(1.) *As regards Atmospheric Nitrogen.*—Some fifty years ago, Boussingault, as well as Lawes, Gilbert, and Pugh conclusively proved that plants do not absorb free nitrogen from the air through their leaves. And yet Ville has brought forward no less conclusive evidence to prove that in some way unknown small quantities of nitrogen always find their way from the atmosphere into a vigorous plant (irrespective of the ammonia and nitric acid that might be derived from the atmosphere).

(2.) *As regards Soil Nitrogen.*—We are told that Liebig declared that cultivable soils have quite enough of nitrogen for agricultural purposes—left by previous generations of plants—and advised that the mineral salts carried away by plants should be returned to the soil. But it was found on the contrary that plants could not do without nitrogenous manures, and that the addition of stable manure gave vigour to plants and seemed to vivify these very nitrogen compounds previously present in the soil.

Prince Krapotkin then goes on to show how experimentalists gradually came to see that chemical experiments carried on in Laboratories were insufficient to explain away the apparent contradictions referred to above, and to account for the true relationship between the plant and the nitrogen found in the soil and the air; how, while we are more and more persuaded that chemical processes that are going on within are complex and unstable compounds are the real basis of life, we have also come to know that the seat of these processes must be looked for in the infinitesimal component parts of the organism and the microscopical inhabitants of its organs.

It has been proved to conviction that the progressive increase in the percentage of nitrogen in soil left uncultivated is due to the lower fungi and micro-organisms which develope in prodigious quantities in decaying vegetable matter. Neither the nitrogen shut up in vegetable mould or in the form of insoluble ammoniacal salts so easily formed in a clayey soil is of any direct avail to plants. It is now known not only that a "living ferment" is necessary for the production of nitric acid and nitrates in the soil, but also that the process of converting ammonia into nitric acid is performed by special microbes, and that two different bacteria are required to accomplish the full process—one to decompose ammonia and transform it into water and nitrous acid, the other to further oxidise this acid and convert it into nitric acid. Without these two microbes, which are continually preparing fresh nitric acid in the soil, while the previous stocks of it are washed into the subsoil, agriculture would be in a precarious state. In the enquiry into the relation between plants and free atmospheric nitrogen, it was first discovered (by Wilfarth and Hellriegel) that the roots of papilionaceous leguminosæ—which striking showed an apparent independence as regards soil nitrogen—were found in fertile soils to be covered with nodules originated from agglomerations of bacteria (*B. radicicola*) which have a sort of symbiotic association with the plants. It has been further demonstrated (by Schlosing, jr. and Laurent) that various mosses and especially algæ (*Confervæ, Oscellariæ Nitrsechea*) which usually develope on the surface of the soil also absorb nitrogen from the air. But leguminoæs are not the only higher plants that can utilize atmospheric nitrogen by the aid of bacteria. *Elæagnus angustifolia* (a garden shrub nearly allied to the laural tribe) has also been found to harbour the bacteria that utilize atmospheric nitrogen, though different from *B. radicicola.* Indeed, it appears that each species of leguminosæ has its own bacteria especially appropriate for entering into a mutual benefit association.

These discoveries, to quote Prince Krapotkin's own words "have solved enigmas of long standing, and to the practical agriculturist they promise a new method for improving the soil by watering it with liquids containing the necessary microbes. Once inoculated into the soil the nitromonade (or *nitrosomonas*) of the soil and the *Bacteria radicicola* in the root nodule will continue their work. . . . . The fact that the nitromonade though devoid of chlorophyll is capable of making the synthesis of organic compounds out of purely mineral salts is of immense importance in the economy of nature."

It has been proved that the beech can only thrive when a mantle of mycorhiza fungi envelope its roots, and while obtaining their nutriment from the soil yield part of it to the roots of the tree. The same has been found true in the case of the pine.

In conclusion, to quote Prince Krapotkin again, "all these are evidently but separate instances of a much more general fact, which only recently became known under the general name of symbiosis, and appears to have an immense signification in nature. Higher plants depend upon lower fungi and bacteria for the supply of that important part of their tissue, nitrogen. Lower fungi associate with unicellular algæ to form that great division of the vegetable world the lichens. More than a hundred different species of algæ are already known to live in the tissues and the cells of animals, and to render each other mutual services. And so on, associations of high and low organisms are discovered every day; and when their conditions of life are more closely examined, the whole cycle of life changes its aspect and requires a much deeper signification."

LAWS OF CEYLON RELATING TO AGRICULTURE.

Chapter X.—*(Continued.)*

6. Provided, however, that nothing in sections 3, 4 and 5 of this chapter shall apply to—

(a) Any channel, watercourse or ela which has been or may hereafter be cut, opened, or constructed for irrigation purposes within a period of not less than one year after such land or premises or portions thereof shall have been cleared and drained for cultivation, except in so far as such channel, watercourse, or ela may be so blocked or obstructed by reason of any further and additional clearing carried on, or any further and additional drains opened, on such land or premises or portions thereof after such channel, watercourse, or ela has been so cut, opened, or constructed as aforesaid; or—

(*b*) Any channel, watercourse, or ela which has been or may hereafter be cut, opened, or constructed for irrigation purposes through, and without payment of compensation to the owner of any land or premises not cleared and drained for cultivation.

7. (1) The owner or occupant against whom any order is made under the last preceding section sha l

(*a*) Perform within the time specified in the order the act directed thereby; or

(*b*) Apply within ten days from the date of service of the said notice, by petition to the District Judge of the district in which such land or premises may be situate, for an injunction to restrain the Government Agent from enforcing such order, on the ground that the same is contrary to law. And every such petition shall be accompanied by an affidavit containing a statement of the facts on which the application is based.

(2) Upon receiving such application the District Judge shall forthwith cause copies of the said petition and affidavit to be served on the Government Agent, and shall fix an early day for enquiry into the matter and give notice thereof, both to the applicant and the Government Agent. If the District Judge after taking evidence which the parties may adduce, or he himself may require, is satisfied that the order is contrary to law, he shall issue such injunction as aforesaid, but if he is not so satisfied he shall make absolute the order of the Government Agent, and in either case he shall award such costs as he shall deem meet.

8. If such owner or occupant to whom such order shall have been given shall refuse or neglect to comply with the same, the said Government Agent shall, if no injunction as aforesaid shall have been served upon him within thirty days from the expriation of the time specified in the notice, cause the obstruction by silt, earth, or other substance to be removed, and shall provide such drains, pipes, and other works as may be necessary; and for that purpose the Government Agent shall have power, and he is hereby authorised to enter into any land or premises, and to cause to enter therein such persons with such instruments and things as may be required.

9. (1) The costs which have been *bona fide* incurred by the Government Agent under section 8 shall be certified under his hand, and shall be a first charge on such land or premises, and on any crop or produce thereof, and on any movables thereon.

(2) The Government Agent shall proceed to recover such costs by seizing and selling such land, premises, crop, produce, or movables, in manner provided in section 1 of chapter IX., and the provisions of that chapter shall *mutatis mutandis* apply to every such seizure and sale.

10. All the powers, duties, and obligations entrusted to or imposed on, the Government Agent by this Ordinnce, shall and may be executed and performed by any Assistant Government Agent within the limits of this district.

H. A. J.

MICROBES.

The term microbe is often vaguely understood, though since of late it occurs very frequently in our daily readings. Professor Crookshank, one of the leading bacteriologists of the day, has contributed a very interesting paper on this subject to the Journal of the Royal Agricultural Society of England.

Microbes are now divided into four classes: Bacteria, yeasts, moulds and protozoa. The first three classes are of vegetable origin and the last includes animal organisms.

Bacteria are such minute objects that when magnified under powerful microscopes, a thousand times, often appear as mere commas or dots in an ordinary printed page. The different classes of bacteria, vary greatly in size and appearance. Some are egg-shaped and found singly, in pairs or in the form of chains, others are rod shaped and some others spiral. From these different shapes bacteria are divided into three classes, viz., micrococci or spherical forms, bacilli or rod forms, spirilla or spiral forms. Bacteria possess the power of motion, and under the microscope they are observed to move to and fro and often turn round and round. They reproduce by division. A bacterium inc easesin size, constricts in the middle and is divided into two. There is another mode of reproduction where distinct spores are formed and shed from the mother bacterium. It is said that a bacterium p oduces two new individuals in an hour; this is a formidable process of reproduction, as at this rate a single bacterium is capable of giving rise to a crop of nearly sixteen and a half million bacte ia in a day. These b cteria, however, require suitable nourishment for their growth, and when this is not found they perish. If not for this provision the multiplication of bacteria would take place to such an extent as to exclude all other living things from the surface of the earth. Bacteria must be supplied with food, they require oxygen, nitrogen, ca.bon, water and certain mineral salts. They cannot thrive at all temperatures—high temperatures and very low temperatures easily kill them. They produce certain changes in the mediums in which they grow, and according to these changes they are classed as pigment bacteria (producing colour stuffs), ferment bacteria (setting up fermentation), putrefactive bacteria (producing decomposition), pathogenic bacteria (causing disease).

Micrococcus prodigiosus is given as an example of a bacteria that produces colour stuffs, it produces a red colour similar in appearance to blood, and is the origin of blood-rain which we often hear. It has even been suggested that this micro-organism was responsible for one of the plagues of Egypt, for it sometimes appears as a blood-red growth covering the surface of pools and ponds in marshy districts. Instances are given of its appearance on the bread of a military bakehouse in Paris, and in some places in Italy. Even in Ceylon we hear of blood-rains. The blood milk which milkmen here sometimes complain of and attribute to "evil eye" may be traced to the presence of this organism. There is also another organism, *Bacillus syncyanus*, which spoil milk by turning it a bluish colour. There are certain bacteria which causes phosphorescence. Fish thrown up on the shores of some coasts become luminous at night owing to the growth of these bacteria.

An instance of bacteria causing fermentation may be found in the case of wines which turn into vinegar. A yeast causes the fermentation of toddy into a liquid containing alcohol, and a protozoa causes a fermentation in butter.

The class of bacteria that causes putrefaction is important in that some of them are useful and others dangerous. These bacteria hasten the disintegration of bodies, and if not for their presence we will find all dead bodies to have mummified. The mummies of Egypt have been preserved by the use of certain ingredients which prevent the attack of putrefactive bacteria. In putrefaction certain alkaloids, *ptomaines*, are found which are very poisonous substances. The poisoning as a result of taking tinned meats &c. is produced by *ptomaines*.

The other class of bacteria are those that produce disease It may be questioned that if it is true that varieties of bacteria are found in the air, water and dust and even in myriads on our own bodies, how could it be possible to attribute the cause of a disease to any of these. But the particular disease germs are met with in the blood and tissues, and when these are artificially cultivated and introduced into the healthy animal body cause disease of the same nature as that which the original person or animal suffered from.

"Foul air is full of germs, water may come from a polluted stream, or be contaminated with sewage from leaky drains, cesspools or with soakage from cemeteries carrying the contagia of typhoid fever, diptheria or cholera. Rags and dust bins are the hamlets of germs, meat and milk may come from animals suffering from tuberculosis or other disease and be unfit for human food. Pure air, pure water, pure food, pure surroundings and a pure life—such are the weapons with which we must oppose these invisible enemies of mankind and avert the dangers to which we are otherwise exposed."

W. A. D. S.

THREE WELL-KNOWN CEYLON GRASSES.

The introduction of *Panicum maximum*, Guinea grass (when and by whom) into Ceylon is not definitely recorded. It is known to have been growing here in 1824. The late Dr. Gardner introduced what he supposed to be a new fodder, but it eventually turned out to be identical with Guinea grass. It was introduced into Jamaica about 1744 from the coast of Guinea. Lunan in his *Hortus Jamaicensis* says that this most valuable grass is a native of Africa and was introduced into the West Indies by a mere accident. A gentleman by the name of Ellis brought over some birds from the cost of Guinea and with them some seeds for their support; the birds dying soon after, the seeds were thrown away as useless. From these seeds grew up some luxuriant grass which attracted Mr. Ellis' notice, and he had a horse and a cow brought where it was, when both greedily ate of it. It was then transplanted into a garden and gradually cultivated, till it became one of the most paying and useful plants in Jamaica.

Mauritius grass, *Panicum molle*, is erroneously so called as it is not native to that country. Its introduction into Ceylon is also obscure. The cultivation of the grass in Colombo was at one time confined to a single firm, viz., Messrs. Wilson, Richie & Co, until their failure some years ago, when the Tamils and Sinhalese (particularly the former) began to cultivate it; and the grass now occupies every bit of lowlying land available in Colombo and the suburbs. Trinius gives Brazil as its native place, but it is said to have originally come to the Botanical Gardens at Calcutta from Sumatra about ninety years ago, and Mr. William Ferguson thought that it very likely spread from there to the various places in which it is now cultivated. Roxburgh mentions that it was Dr. Charles Campbell who brought it to Calcutta in 1804.

Cynoden dactylon is the well-know *doob* grass (also called *Huryalee* and Arugam-pillu by the Tamils). It is considered the most nutritious of the natural grasses for cattle, and is indigenous to the Island. Hitherto it has been described under about a dozen scientific names, and is identical with the Panicum dactylon of Linnæus. The grass occurs over a great part of the world—in England and other parts of Europe, India, China, Thibet, Australia, South and Central America and the Cape. It is believed to be the Agrostis of the Greeks, and its perfect flowers considered "among the loveliest objects in the vegetable world.' Its usefulness and beauty have led to its being made "sacred" to some of the Hindu deities.

NEW METHODS WITH TOBACCO.

The usual method of harvesting tobacco leaves for curing is to cut away the stalks of the plants and afterwards strip off the leaves. Another method is, however, being adopted in the Southern States of America, and the following account from the *Cultivator and Country Gentleman* shows the advantages of the new process over the old, and should be of interest to local tobacco growers:—

Under this system the routine of planting and cultivation need not differ essentially from that in general use. The first important divergence from the ordinary line of practice is made when harvesting begins. The usual way is to cut the stalk at the ground, at the time when the largest part of its leaves are ripe. Just previous to this, topping of the plant is done, when a number of the upper and immature leaves are broken off and thrownaway. By the new plan, the leaves which ripe first are plucked from the stalk, leaving therest to be gathered as they mature. The bottom leaves which are thus saved, as they are the first to ripen, would otherwise decay and be lost before the other leaves of the plant are ready to be harvested. The leaves are gathered at several different times, always from the bottom, until nothing of the plant is left in the field but the stalk and its suckers. Removing the first leaves is said to hasten the maturity of the rest, so that the entire crop may be secured earlier than it could be otherwise, thus lessening the danger from frost. Finally, the top leaves, which when ripened are not without value, are saved.

Removing a part of the leaves admits the sunshine more freely to the others and also to the ground at the roots of the plant. This is regarded as essential to the perfect distillation and secretion of the subtle oil that gives the finest wrapper leaf its delicate aroma, and which is complete only in the thoroughly ripened leaf.

A great advantage claimed for this process is the complete separation of the leaf from the stalk as soon as the leaf is ripe. It is said that, if the leaves are not removed, the stalks will extract nearly two ounces ot the oil of tobacco from every pound of leaves cured on them, and that when the leaves are cured separately, the tobacco is about 15 per cent. heavier than it would otherwise be.

The leaves of the tobacco plant do not all ripen at the same time, and while the upper ones are maturing, the lower leaves are becoming worthless. This fact puts the farmer in a dilemma. If he leaves the plant until some of its leaves are over-ripe, it is believed that their oil is absorbed by the stalk and their value thus impaired. If he cuts the plant while some leaves are green, these immature leaves will be of little worth. It is urged that loss in either direction may be avoided by taking off the leaves as fast as they ripen.

In practice the leaves are gathered and laid in baskets 3 feet long, 18 inches wide, and 9 inches deep, and in them conveyed to the curing-house. This building is provided with heating apparatus, usually in the basement. The leaves are strung on steel wires, 84 leaves to a "stick." As soon as a "section" of sticks is filled, it is hoisted to its place. The leaves are cured in a very short time, compared with the process of air-curing on the stalk. House-burn, or pole-sweat, is said to be entirely avoided.

It is estimated that the tobacco stalks grown on an acre of average land contain 4,000 lb. of water. When damp or rainy weather prevails, it is believed that this quantity of water in the stalks is a serious drawback to good cures in tobacco sheds, and is a probable cause of pole-sweat. When the weather is propitious, and the best results with the stalk-cure are obtained, it is argued that the leaf is more or less impregnated with a bitter flavor, gathered from the tannin contained in the stalk.

The above are, in substance, the leading arguments advanced by the advocates of the leaf-cure as against the stalk-cure. As to the merits or demerits of the former, I do not care to express a positive opinion. Intelligent growers will doubtless investigate and judge for themselves. Several patents are held in connection with the process. In the few instances in which the leaf-cure has been tried in Connecticut and Pennsylvania, the growers have seemingly concluded that its advantages over the old method are more than offset by the great additional labor and expense involved.

CRUELTY TO ANIMALS.

Animals are cruelly treated under different circumstances. Many owners only think of getting as much work or making as much money out of their animals as possible. There are others who seem to derive a sort of morbid enjoyment by illtreating their beasts &c. There is yet a third way in which animals suffer, in that they are subjected to different methods of treatment which cause them pain, with the object of doing them some good. This last form of cruelty is more or less due to ignorance, the first-mentioned to selfishness, and the second to wanton cruelty.

In any scheme for the prevention of cruelty to animals no practical good can be effected without taking into consideration the origin of the forms of cruelty. Punishment is no doubt a necessity in most cases, but before a person is punished for alleged cruelty, it is always advisable to take into consideration the motive or motives that led to the act.

Here in Ceylon the forms of cruelty we meet with are not very numerous. Lame bulls or those with sore necks are put to the yoke, or lame horses are made to trot about with heavy traps all day. Children and often grown up people in a few instances illtreat harmless creatures, but such instances are extremely rare. Branding is the form of cruelty which is perpetrated through ignorance.

A Society is useful in checking these practices, but when that Society can employ only one or two paid agents to travel about the length and breadth of the island, the advantages gained will be very small, and perhaps nothing. The evidence of the activity of the paid agent should not be gauged from the number of prosecutions entered in the Courts nor the amount of fines recovered, but from the condition of animals that are seen about. It is a noteworthy fact that we come across, almost daily, horses used in waggons and cattle used in carts that are not actually fit for the work; but these are allowed to go about unmolested, whereas a few are now and again prosecuted.

Cruelty to animals is a Penal Act in the island, and any breach of this Act should be duly noted by the guardians of the peace, and if in any way these officers neglect to do their duties, it is for the public and within the province of a Society to insist on their attention to this duty. A S.P.C.A., if it appoints paid agents at all, should do so to note the extent to which cruelty exists, and then to inform the Society not against the owner of animals but against those who neglect to perform their duties. It is a great pity that no one has yet recognized the fact that the very appointment of special agents to carry on the work of prosecuting those committing cruelty to animals is in itself the most damaging to the cause they have at heart: for by that means they imply that either an act of cruelty and a breach of the law in that respect is not of much importance, and the officers of Government who are specially appointed to see the laws of the Island carried out do not take a serious view of such acts, or that the cruelty exists only in the eyes of a band of persons who are joined together to form a Society for P.C.A.

The legitimate duties of a S.P.C.A. should be, if the aims of the Society are actually to benefit the animals and ensure their better treatment, to instruct the people in humanity, and to show them an example by providing suitable institutions for treating animals when ill or otherwise disabled. They may if they find their resources ample also devote some of them in seeing that the duly authorized guardians of the law do not neglect their duties in respect of paying due attention to cases of cruelty.

W. A. D. S.

CUTCH.

The *Agricultural Ledger* No. 1 of 1895 is devoted to an exhaustive account of Acacia Catechu and its products. The three important

products of the tree are "dark catechu" or the commercial *Cutch*, "pale cutch" or *Katti* (identical with the "kaipoo" used by the Sinhalese to chew with betel, lime, tobacco, and areca), and kirsal or khersul, a resinous product of great value found imbedded in the wood. The following is an account of the method of preparing "dark catechu" or the commercial Cutch, the valuable tan in India and Burmah. (Query? Have the Cutch Company the "Rat-Kihiri" trees among those to be operated on?)

The trees that yield this substance are regarded as mature when about a foot in diameter. They are then felled and cut up into blocks two or three feet long. In some parts of the country the Natives ascertain whether it will pay to cut the trees, by making a small notch into the heart-wood. Trees between twenty-five and thirty years old are regarded as best suited and are said to yield more or less according to the number of white lines perceived in the heart-wood. The bark and the outer sap wood are generally removed and rejected. The red heart-wood is then cut into small chips. In certain districts the branches are not utilized in the preparation of the extract, in others they are so used. The chips are then boiled in water in earthen pots for twelve hours. When the water is reduced by one-half, the chips are taken out and the liquid placed in large iron pans or cauldrons and again boiled and stirred till it attains the consistence of syrup. The cauldrons are then taken off the fire and the stirring of the liquid continued till the mass is cool enough to be moulded, when it is taken out and spread on leaves arranged within a frame or mould and left for the night. In the morning the Cutch is dry and then exists as brick-like masses that each weigh 36 to 44 lb. These are broken up into pieces ready for the market. The process of boiling and preparation of the dry extract varies considerably all over the region where the article is made, but the principle is the same as that given above, which may be said to be the Pegu system. Occasionally the chips are boiled a second time with the production of a small amount of inferior stuff. In other cases the red liquid is poured over fresh chips and again boiled.

From the widespread conviction of the necessity for stirring or beating the concentrated solution (on its being removed from the fire), it might almost be inferred that sone chemical change was thereby effected similar to the oxidation produced by beating the indigo-vat solution. Thus for example, in Baroda the decoction is strained through a blanket. For this purpose the blanket is dipped into the fluid, stirred about and then wrung out, while the blanket is being held at as great a height as possibel. By this process the liquid falls through the air in a greatly divided stream or shower, and this is continued for an hour or so, the liquid being repeatedly wrung through the blanket, the trough is then covered over with a lid of split bamboos and the sediment allowed to subside. The water is then poured off and the extract cut into small cakes and allowed to dry. In Bariya (Guzerat) the thick decoction is poured into pits, five or six feet deep, in the bottom of which baskets are placed. The liquid drains off, the chips are retained in the baskets and the solid extract formed on the floor of the pits. This is removed and dried on leaves while exposed to the sun.

Speaking of the Pegu system, it is admitted that much difference of opinion prevails as to the value and extent necessary of the heating process. One writer says it is more of a "beating up" than "stirring," but I have never been able to ascertain what the object or effect of the process is. Cooks differ, to, in the amount of beating up that is desirable, some being satisfied with half an hour's application. It will be seen below in connection with the subject of *Kath* that a peculiar system of encouraging crystallization (which may be analogous to the beating) is considered essential.

In Pegu the manufacture of this article extends from June to March, but the months of December to March are regarded as the best. In April and May scarcity of water is supposed to stop the works, while in the rainy season the difficulty of transport checks the industry.

As to the amount of Cutch yielded by heart-wood, it had been stated that from 3 to 10 per cent. in weight would be a good average. In other words, one ton of timber in the round might be taken as yielding 250 to 300 lb. of Cutch.

The Cutch trade appears in several forms. The Pegu variety occurs in masses with layers of leaves between the successive preparations. But Cutch is also met with in cubes of various sizes which often show the markings of leaves used in the moulds, or it occurs in sharply-defined cubes or blocks from having been cut up by a string or wire run through the still plastic mass. In other cases it is sold in rounded balls or flattened cakes made in the hand.

In colour it is externally of a rusty brown, internally a dirty orange to dark liver-colour, and in some cases almost black or port-wine coloured. It is inodorous, but has an astringent bitter taste, followed by a sense of sweetness. It is brittle and breaks with a more or less resinous shining fractrue.

CEYLON WOODS.

(Continued from September issue.)

56 Samydaceæ.
126 Homalium zeylanicum. Liyan.
57 Cornaceæ.
127 Alangium lamarkii.
128 Mastixia tetrandra. Diya-taliya.
67 Rubiaceæ.
129 Sarcocephalus cordatus. Bak-mi.
130 Adina cordifolia. Kolon.
131 Stephegyne parviflora. Helamba.
132 Wendlandia notoniana. Ruwan-idala.
133 ,, zeylanica. do
134 Gardenia latifolia. Galis.
135 Canthium didymum. Porawa-mara, Gal-karanda.
136 Ixora parviflora. Maha-ratambala.
137 Morinda tintoria. Ahu.
74 Vacciniaceæ.
138 Vaccinium leschenaultii.
79 Sapotaceæ.
139 Chrysophyllum Roxburghii. Lawulu.
140 Isonandra wightiana. Kiriwarala.
141 Dichopsis petiolaris.
142 ,, grandis. Kiri-hembiliya, Kiri-hiriya, Mihiriya.
143 Bassia longifolia. Mi.
144 ,, neriifolia. Gan-mi.

145 Bassia fulva. Wana-mi.
146 Mimusops elengi. Munamal.
147 ,, hexandra. Palu.
80 Ebenaceæ.
147(*a*) Maba buxifolia. Kalu-habaraliya.
148 Diospyros montana.
149 ,, embryopteris. Timbiri.
150 ,, ovalifolia.
151 ,, ebenum. Kaluwara.
152 ,, oocarpa. Kalu-kadumberiya.
153 ,, gardneri. Katumberiya.
154 ,, insignis. Gona, Porua-malla, Wal-mediriya.
155 ,, thwaitesii. Ho-mediriya.
156 ,, erumenata.
83 Salvadoraceæ.
157 Salvadora persica. Mustard tree.
84 Apocynaceæ.
158 Ochrosia borbonica. Mudu kaduru.
159 Alstonia scholaris. Ruk-attana.
160 Wrightia angustifolia.
86 Loganiacae.
161 Strychnos nux-vomica. Goda-kaduru.
162 ,, potatorum. Ingini.
96 Bignoniaceæ.
163 Stereospermum chelonioides. Lunu-madalu.
99 Verbenaceæ
164 Tectona grandis. Tekka. Teak.
165 Premna tomentosa. Bu-seru.
166 Vitex trifolia.
167 ,, altissima. Milila, Milla, Sapu-milila.
168 ,, Leucoxylon. Nebedda.

THE FERTILITY OF SOILS.

(PROFESSOR KINCH.)

The fertility of a soil is partly dependent on its chemical composition, but also partly on its mechanical and physical condition. Its productiveness is influenced very largely by its environments of climate and weather. Upon the size of the prevailing particles in a soil its physicl properties. and therefore its fertility, largely depends; the actual total number of particles amount to many millions, or even hundreds of millions, per grain weight of soil. When the size of the particles is large, good crops can only be grown with the copious addition of manures, especially those containing organic matter, or by means of irrigation. Grass grows well in soils with very fine particles. The coarser particles of the soil, including sand, have little cohesion, and little power of holding water. A gravelly or sandy soil is therefore easy to work with a plough, as its tenacity is low; it is dry, as it holds little water, and that is readily evaporated; it is, under most conditions, warmer than a clayey soil; it has some advantages for market gardening. Soils containing very fine particles and clay are tenacious, and, as such, stiff; they retain much more water than sandy soils, and do not dry so readily; their capillary power is greater; they are colder than sandy soils. Soils having very much the same ultimate chemical composition might be in either of these categories, according to the fineness of their particles. Both sandy and clayey soils are improved by the addition of humus, the decaying organic matter of the soil. In sandy soils it holds together or cements the soil particles: it increases their power of holding water and their power of absorbing water from the air, and so renders them less liable to be burnt up in dry weather. Organic matter added to clay diminishes its coherence, and makes it more easily worked; the ameliorating effects of long dung on heavy clay are well known. Humus has a greater power even than clay of absorbing water. Humus not only exerts important effects of a physical nature, but it is important from a chemical point of view as a storehouse of the most valuable constituent of plant food. The good properties, and, therefore, the fertility of a soil, are increased by the presence in it of easily decomposable compound silicates, which exert an influence on its absorptive powers for some of the important ingredients of plant food.

Sometimes it is necessary to distinguish between what may be called the inherent and, to some extent, permanent fertility of the soil, and its temporary fertiliy or high agricultural "condition"—which latter has been brought about by the care, skill, and capital of the cultivator, and which he can to a large extent remove in his crops. The inherent fertility is much more difficult to remove, and only very slowly disappears under adverse circumstances; upon it the amount of the rent of land depends to a considerable extent.

CHEMICAL CONDITIONS OF FERTILITY.

Plants obtain from the soil all the ash constituents they contain, and most plants obtain thence, also, the nitrogen they require for their growth. It follows that if the most important chemical constituents of a soil are nitrogen, phosphoric acid, potash, and lime, the soil to be fertile must not only contain these constituents, amongst others, in a good proportion, but they must be in a form in which they are available to the plant as food. If they are locked up in a totally insoluble form, they might be present in the soil in large amounts and yet the soil be absolutely sterile. A soil to be fertile must also be free from poisonous and injurious matter—such as decomposable sulphides, excess of ferrous salts, excess of saline matter, especially of common salt, and even from too large a quantity of acid organic matter. But the actual fertility of a soil, as far as it can be measured by chemical means, is dependent mainly on the amount and the conditions of the four ingredients—nitrogen, phosphoric acid, potash, and lime.

It has been seen for many years that of any one factor making up the fertility of a soil the nitrogen is the most important. The nitrogen of a soil is almost entirely contained in the organic matter or humus, which consists of the residues of previous races of plants which have grown in the soil and decayed there. Sir John Lawes has pointed out more than once that "fertility is due to the organic residue of previous generations of plants, mixed with certain mineral substances, the most important of which are phosphoric acid and potash." Lawes and Gilbert, in a paper read to the Chemical Society in 1885, also state that "not only the facts adduced in this and former papers, but the history of agriculture throughout the world, so far as it is known, clearly shows that, pre-eminently so far as the nitrogen is concerned, a fertile soil is one which has accumulated within it the residue of ages of natural vegetation, and that it becomes infertile as this residue is exhausted." A soil rich in humus is rich in nitrogen, though the one is not an exact measure of the other, as the percentage of nitrogen in humus is somewhat variable. Also, this nitrogen is not all equally valuable to the plant. Some of it may be in a form in which it soon becomes assimilable,

whilst part of the organic matter strongly resists the processes of oxidation and decay in the soil, and so the nitrogen in it remains for a long time in a locked-up form, in which the plant can make no use of it. This, indeed, is a very advantageous provision, as if the nitrogen all became available and soluble in a short time it would certainly be largely wasted by being washed out of the soil ere plants could utilise it. The chemical analysis of a soil is a matter requiring a good deal of time and a good deal of skill, and when it is done it may not tell us all we want to know. We can find out the total amount of nitrogen, phosphoric acid, potash, &c., in the soil, or the amount soluble in strong hydrochloric acid, or, with greater difficulty, the amount soluble in water; but none of these represents the amount of plant food which the plant itself is capable of attacking in, and absorbing from, the soil. Moreover, different plants have different powers of taking up the various plant food. All plants, however, can undoubtedly take up from soils matter which is not soluble in water, and this they no doubt accomplish by means of the acid sap in their rootlets or root hairs.

(*To be continued.*)

THE MANUFACTURE OF RHEA FIBRE.

So much of a contradictory character has recently been published regarding the Rhea fibre and the rival methods of preparing it, that the ordinary reader has learned to treat the subject as only in the experimental stage and of doubtful practial value. Our readers will therefore be interested in the following particulars of rhea in connection with the Gomess process of preparation. Only recently we have had an opportunity to see and examine samples of the rhea fibre in every stage of manufacture, including the finished and dyed article in the form of yarns, cords, and cloth, as prepared under the Gomess patents. The plant itself grows wild in many parts of India, and is already cultivated in several districts. Its productiveness may be shown by the following figures. From Mr. Favier's book on "Textile Nettles" it appears that Mr. Montgomery cultivated rhea in the Kangra Valley, and produced 1,900 lb. of rhea ribbons or bark per acre for twelve successive years. Mr. Gustav Mann, Conservator of the Assam Forests, produced 1,800 lb. per acre. The Indian Husbandry Co., at present working in Bengal, report their production to be over one ton per acre, and Mr. Manuel, of Lucknow, in his report gives the average production of dried rhea ribbons in well-manured and moist ground to be one ton per acre per annum; while Mr. Fredrick Pincott has contracted to supply the London Rhea Fibre Treatment Co., Ltd., 15,000 tons of rhea ribbon from India at £7 or R130 per ton f.o.b.

The ribbons after being separated from the natural gum by the Gomess process become *filasse* within twenty-four hours, with a loss of 30 per cent. on the original weight. There is thus 14 cwts. of *filasse* left, which, it is said, will find a ready market in England at £112 per ton. The product of an acre when washed is thus equal to £77 per ton. The present market value of rhea ribbon is from R120 to R140 per ton, but it is highly probable that more extended cultivation will bring it down to a price ranging from R80 to R100 per ton, or R60 to R65 per acre as the cost of cultivation. Thus the cultivation of rhea will be much more profitable than that of cotton.

Considering the enormous cotton production of the United States it is a noteworthy fact that the Senate at Washington has just passed a Bill with a view to encourage the cultivation of the rhea plant, offering Government subsidies to successful cultivators in three of the southern states of the Union. From a practical point of view the strength of the rhea fibre is its chief physical quality. According to Dr. Forbes Royle, who tested it as an expert, its strength is equal to two and a half times that of Russian hemp. According to Trautwine, the best hemp ropes require 15,000 lb. strain per square inch of section to break them, while leather of the best quality gives way at 5,000 lb. We have thus the comparative breaking strength as follows:—

Hemp	15,000 lb.	per sq. inch
Leather	5,000 ,,	,,
Rhea	37,500 ,,	,,

Rhea is thus naturally designed for all purposes in which the utmost strength is required in cordage or cloth. The next physical property of the fibre is its fineness, which allows it to be mixed with all the finest animal and vegetable fibres known, and to be spun into the finest of yarns up to 300's. When prepared for spinning it is of the purest white colour, with a silky lustre, and it readily takes dye of every shade. The samples exhibited by Mr. Wookerjee, who has acquired all the rights of the Gomess Patents for British India, consist of the green plant; the raw ribbons as they come from the plant; dried ribbons freed from gum (*filasse*); filasse silver; rhea yarns plain and dyed from 10's to 60's; rhea cord, white and dyed; rhea tatted shawl dyed magenta; corded cloth of rhea and silk mixed; and figured cloth of rhea dyed. The beauty of these samples and the remarkable strength of the yarns cannot fail to impress all judges of textile materials or products. A small factory is at present being organized in Bombay where the Gomess process of removing the gum from the ribbon will be shown at work on a commercial scale, with apparatus of full size, and all persons interested in the use of goods made from rhea or in the manufacture of rhea will be invited to see this factory at work. In addition, apparatus will be prepared for carrying out comparative trials of strength of rhea and other cordage and yarns, by breaking them with deadweights. In this manner the value of rhea for main driving ropes in mills, driving cords and banding, belting, tent and heel ropes, traces, harness and reins, cordage for shipping, twines and threads, sailcloth and canvas for tents, and fishing lines and nets will be recognised. In many of the above instances the saving of weight is of great importance, as, for instance, in tent ropes and canvas, and the saving in cost for cordage or material of a given strength is illustrated in the case of belting, which is sold by weight.

Assuming Dr. Royle's experiments to be correct, the breaking strength of a rhea belt a little over $3\frac{1}{2}$ of an inch in thickness would be equal to that of first-class leather $\frac{3}{4}$ of an inch thick. Such a belt would not bear forked guides, but the difference in cost would pay for friction clutches, which, even for belt driving, will eventually supersede the clumsy and destructive fork. The experimental factory now being established and the operations that are to be shown therein will be of the highest

interest to all who are concerned in textile manufacture or business in India, and they will doubtless find that such a practical demonstration as is to be given will be more readily appreciated than any printed description.

One fact interesting to the cotton mill-owner has been published in the prospectus, *viz.*, that the existing cotton machinery can be adapted, with certain modifications and at a reasonable cost, for the manufacture of the rhea fibre, though the well-known firm of Messrs. Greenwood and Batley, of Leeds, have gone the length of designing special machinery for producing yarn and manufactured goods from the rhea fibre *filasse*. A parent company for India has been founded in Bombay, which has the right of forming sub-companies in different parts of the country, and in the meantime Mr. Cowasji Wookerjee has been empowered to grant licences for the manufacture of rhea according to the Gomess patent process. It is claimed for this process that it is the only invention of its kind which has been granted patents in Germany and the United States of America, besides other European countries and India. The subject, on the whole, deserves the careful attention and study on the part of the investing public, considering the wide field of utility the rhea fibre has before it. The shares of the London Company have been reported to be at a premium, and we hope the Indian companies will meet with the same success.—*The India Textile Journal.*

GENERAL ITEMS.

One of the most universally distributed orange scale is the *Aspidiotus aurantii* which is commonly found sticking on to the rind of the fruits, giving it a very unsightly appearance. Repeated applications of kerosine emulsion are most effectual for this as for all other scales.

A writer in an Exchange gives his experience of preserving orange: The plan I adopt is to leave the oranges on the trees till well ripened, carefully gathering in baskets and on no account allowing any that drop from trees to get into baskets, as the slightest bruise will rot an orange. I always had large packing cases in an outbuilding in which they were packed. I first put a layer of dry river sand, then one of oranges, which must not touch each other, and so on till the box is full. Oranges were gathered about the end of July and boxes opened for consumption in midsummer. The sand must of sourse be clean and perfectly dry.

In view of the extension of grape cultivation in Ceylon, the following from the *N. S. W. Agricultural Gazette* should prove of interest:—Mr. E. Herborn, of Minto, reports the successful treatment of black spot of the grape with sulphate of iron and sulphuric acid. He writes: "My vineyard had suffered considerably the previous season, and I determined to try the following (last) winter this remedy. I treated about half the vineyard only with one application only. As the spring advanced and foliage and fruit developed, the most unpractised eye would at once be struck with the remarkable difference in the appearance of the two halves of the vineyard. The one exhibited vigorous, healthy foliage, with a good show of fruit; the other, scanty yellowish foliage, and shrivelled berries, or none at all. Had the whole vineyard been similarly treated the proof of the efficacy of the remedy would not have been so clear, as an improvement in the vineyard, as compared with the previous season, might have been attributable to other causes. Under the circumstances I have narrated, however, cause and effect were in unmistakable evidence. I shall not fail to treat my vines several times this winter. I use ½ per cent. sulphuric acid in a saturated solution of sulphate of iron, any time before the buds burst, following up with Bordeaux mixture, which latter is, I believe, also a specific for Oïdium."

The black sooty appearance common on orange trees is due to the presence of the mycelium of a fungus, *Capnodium citri*, which grows on the sugary secretions of scale insects. It injures the tree by blocking up the stomata of the leaves. The true cause of the trouble being the scale insect, the tree should be treated persistently with kerosene emulsion.

An ointment, says the Editor of the Cape Colony *Agricultural Journal*, made of equal parts of flowers of sulphur and grease, laid on in a streak as broad as your hand all down the backs of horses and cattle will rid them of ticks. The diffusive qualities of sulphur are something not well understood, but may be easily tested.

The *Adelaide Observer* states that in making Bordeaux mixture it is of the greatest importance that air-slaked lime should be rejected. The lime must be strong and fresh from the kiln. The bluestone must be the best. This is the latest way to make Bordeaux mixture:—Dissolve 6 lb. of best sulphate of copper in 6 gallons of boiling water in one vessel large enough to hold 22 gallons. In another vessel place 4 lb. of fresh lime; pour on a little water, but not enough to cover the lumps; when that is taken up add a little more water; after a litle add enough to make 4 gallons. Strain the lime water through a branbag or fine sieve into the vessel of bluestone water, and make up to 22 gallons by the addition of more water. Use the mixture without much delay, as it spoils by being kept for more than a few hours.

Leg weakness in poultry may arise from muscular weakness or from a deficiency of bony matter, and the symptoms usually manifest themselves between the ages of three and six months. The free use of bone dust is a preventative of this affection, but a cure is not difficult by using the following prescription:—Sulphate of iron 1 grain, strychnine ½ grain, Phosphate of lime 5 grains, and sulphate of quinine ½ grain. Make a small pill and administer three times daily—morning, noon and night.

Writing to the *Australasian*, "Grazier" says:—I have found the following a very easy and efficacious way of getting rid of worms:—Tie the horse up in the stable and starve him for at least 12 hours, and then give him about a quart of new milk quite warm from the cow. This will rid the horse of all the worms.